



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 11, 2003

Addendum No. 1

RE: Contract ID: C200738 (Proposal No.1)
Work Order No. 6.589017T
Richmond County (R-2231A)
US-220 Bypass From South of SR-1448 to North of SR-1452.

July 22, 2003 Special Letting

To Whom It May Concern:

Reference is made to the proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the proposal form:

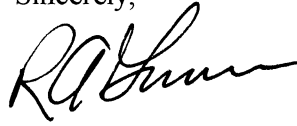
On Page No. 119, the Project Special Provision entitled "Permits" has been revised.
Please void Page No.119 in your proposal and staple the revised Page No.119 thereto.

New Page Nos. P-1 thru P-156 are being added to include the 404 and 401 permits for the project. These permits apply to all sections of Project R-2231. The Contractor's bid shall take into consideration all terms and conditions specified in said permits. Please add new Page No. P-1 thru P-156 after Page No.119 in your proposal.

The Table of Contents has been revised to reflect the above changes. Please void the Table of Contents in your proposal and staple the revised page thereto.

Each addendum package will contain an addendum letter and a copy of the permit for each of the 6 proposals (R-2231A, R-2231B, R-2231A&B, R-2231CA, R-2231CB and R-2231CA&CB) for your use. Please disregard any letter and copy of the permit for any project which you did not order.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. A. Garriss', written in a cursive style.

R. A. Garriss, P.E.
Contract Officer

RAG/jag/pa

Attachments

Cc: Mr. J. D. Goins, P.E.
Mr. S. D. DeWitt, P.E.
Mr. W. F. Rosser, P.E.
Ms. D. M. Barbour, P.E.
Mr. J. V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Aydren Flowers
Mr. Ron Davenport, Jr., P.E.
Ms. Kim Canady
Ms. Yang Steelman
Project File (2)

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters

U. S. Army Corps of Engineers

Water Quality

Division of Environmental Management, DEHNR
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the appropriate permit agency to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

PROJECT: 6.589017T
 RICHMOND COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 11, 2003

Addendum No. 1

RE: Contract ID: C200280 (Proposal No.2)
Work Order No. 6.589018T
Richmond County (R-2231B)
US-220 Bypass From South of SR-1455 to North of NC-73.

July 22, 2003 Special Letting

To Whom It May Concern:

Reference is made to the proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the proposal form:

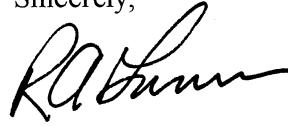
On Page No. 109, the Project Special Provision entitled "Permits" has been revised.
Please void Page No.109 in your proposal and staple the revised Page No. 109 thereto.

New Page Nos. P-1 thru P-156 are being added to include the 404 and 401 permits for the project. These permits apply to all sections of Project R-2231. The Contractor's bid shall take into consideration all terms and conditions specified in said permits. Please add new Page No. P-1 thru P-156 after Page No.109 in your proposal.

The Table of Contents has been revised to reflect the above changes. Please void the Table of Contents in your proposal and staple the revised page thereto.

Each addendum package will contain an addendum letter and a copy of the permit for each of the 6 proposals (R-2231A, R-2231B, R-2231A&B, R-2231CA, R-2231CB and R-2231CA&CB) for your use. Please disregard any letter and copy of the permit for any project which you did not order.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. A. Garriss', written in a cursive style.

R. A. Garriss, P.E.
Contract Officer

RAG/jag/pa

Attachments

Cc: Mr. J. D. Goins, P.E.
Mr. S. D. DeWitt, P.E.
Mr. W. F. Rosser, P.E.
Ms. D. M. Barbour, P.E.
Mr. J. V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Ayden Flowers
Mr. Ron Davenport, Jr., P.E.
Ms. Kim Canady
Ms. Yang Steelman
Project File (2)

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters

U. S. Army Corps of Engineers

Water Quality

Division of Environmental Management, DEHNR
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the appropriate permit agency to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

PROJECT: 6.589018T
RICHMOND COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 11, 2003

Addendum No. 1

RE: Contract ID: C200873 (Combined Proposal No.3)
Work Order No. 6.589017T, 6.589018T
Richmond County (R-2231A, R-2231B)
US-220 Bypass From South of SR-1448 to North of NC-73.

July 22, 2003 Special Letting

To Whom It May Concern:

Reference is made to the proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the proposal form:

On Page No. 144, the Project Special Provision entitled "Permits" has been revised. Please void Page No. 144 in your proposal and staple the revised Page No. 144 thereto.

New Page Nos. P-1 thru P-156 are being added to include the 404 and 401 permits for the project. These permits apply to all sections of Project R-2231. The Contractor's bid shall take into consideration all terms and conditions specified in said permits. Please add new Page No. P-1 thru P-156 after Page No. 144 in your proposal.

The Table of Contents has been revised to reflect the above changes. Please void the Table of Contents in your proposal and staple the revised page thereto.

Each addendum package will contain an addendum letter and a copy of the permit for each of the 6 proposals (R-2231A, R-2231B, R-2231A&B, R-2231CA, R-2231CB and R-2231CA&CB) for your use. Please disregard any letter and copy of the permit for any project which you did not order.

The Expedite file for Contract No. C200873 has been updated to allow the MB/WB information to be entered. Please download the EBS addendum file and follow the instructions for applying the addendum. Bid Express will not accept your bid unless all addendums have been applied.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. A. Garriss', with a stylized, flowing script.

R. A. Garriss, P.E.
Contract Officer

RAG/jag/pa

Attachments

Cc: Mr. J. D. Goins, P.E.
Mr. S. D. DeWitt, P.E.
Mr. W. F. Rosser, P.E.
Ms. D. M. Barbour, P.E.
Mr. J. V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Ayden Flowers
Mr. Ron Davenport, Jr., P.E.
Ms. Kim Canady
Ms. Yang Steelman
Project File (2)

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters

U. S. Army Corps of Engineers

Water Quality

Division of Environmental Management, DEHNR
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the appropriate permit agency to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

Revised 7-11-03

PROJECT: 6.589017T, ETC.
RICHMOND COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 11, 2003

Addendum No. 1

RE: Contract ID: C200739 (Proposal No.1)
Work Order No. 6.589012T
Montgomery, Richmond Counties (R-2231CA)
US-220 Bypass From North of NC-73 to South of SR-1524.

July 22, 2003 Special Letting

To Whom It May Concern:

Reference is made to the Cross-Section Plans and Proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the proposal form:

On Page No. 121, the Project Special Provision entitled "Permits" has been revised. Please void Page No.121 in your proposal and staple the revised Page No.121 thereto.

New Page Nos. P-1 thru P-156 are being added to include the 404 and 401 permits for the project. These permits apply to all sections of Project R-2231. The Contractor's bid shall take into consideration all terms and conditions specified in said permits. Please add new Page No. P-1 thru P-156 after Page No.121 in your proposal.

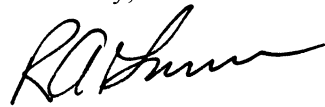
The Table of Contents has been revised to reflect the above changes. Please void the Table of Contents in your proposal and staple the revised page thereto.

Each addendum package will contain an addendum letter and a copy of the permit for each of the 6 proposals (R-2231A, R-2231B, R-2231A&B, R-2231CA, R-2231CB and R-2231CA&CB) for your use. Please disregard any letter and copy of the permit for any project which you did not order.

The following revision has been made to the cross-section plans:

Sheet No. X-9 was inadvertently omitted. Please staple sheet No. X-9 (provided) after sheet No. X-8 in your cross-section plans.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. A. Garriss', with a stylized, flowing script.

R. A. Garriss, P.E.
Contract Officer

RAG/jag/pa

Attachments

Cc: Mr. J. D. Goins, P.E.
Mr. S. D. DeWitt, P.E.
Mr. W. F. Rosser, P.E.
Ms. D. M. Barbour, P.E.
Mr. J. V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Ayden Flowers
Mr. Ron Davenport, Jr., P.E.
Ms. Kim Canady
Ms. Yang Steelman
Project File (2)

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters

U. S. Army Corps of Engineers

Water Quality

Division of Environmental Management, DEHNR
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the appropriate permit agency to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

Revised 7-11-03

PROJECT: 6.589012T
MONTGOMERY / RICHMOND COUNTIES

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Item Sheets
Award Limits
Signature



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 11, 2003

Addendum No. 1

RE: Contract ID: C200279 (Proposal No.2)
Work Order No. 6.589016T
Montgomery County (R-2231CB)
US-220 Bypass From South of SR-1524 to
Existing 4 Lanes North of US-220 Alternate.

July 22, 2003 Special Letting

To Whom It May Concern:

Reference is made to the Proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the proposal form:

On Page No. 122, the Project Special Provision entitled "Permits" has been revised.
Please void Page No. 122 in your proposal and staple the revised Page No. 122 thereto.

New Page Nos. P-1 thru P-156 are being added to include the 404 and 401 permits for the project. These permits apply to all sections of Project R-2231. The Contractor's bid shall take into consideration all terms and conditions specified in said permits. Please add new Page No. P-1 thru P-156 after Page No. 122 in your proposal.

The Table of Contents has been revised to reflect the above changes. Please void the Table of Contents in your proposal and staple the revised page thereto.

Each addendum package will contain an addendum letter and a copy of the permit for each of the 6 proposals (R-2231A, R-2231B, R-2231A&B, R-2231CA, R-2231CB and R-2231CA&CB) for your use. Please disregard any letter and copy of the permit for any project which you did not order.

Sincerely,

A handwritten signature in black ink, appearing to read "R. A. Garriss".

R. A. Garriss, P.E.
Contract Officer

RAG/jag/pa

Attachments

Cc: Mr. J. D. Goins, P.E.
Mr. S. D. DeWitt, P.E.
Mr. W. F. Rosser, P.E.
Ms. D. M. Barbour, P.E.
Mr. J. V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Aydren Flowers
Mr. Ron Davenport, Jr., P.E.
Ms. Kim Canady
Ms. Yang Steelman
Project File (2)

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters

U. S. Army Corps of Engineers

Water Quality

Division of Environmental Management, DEHNR
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

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Revised 7-11-03

PROJECT: 6.589016T
MONTGOMERY COUNTY

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PROPOSAL FORM ITEM SHEETS, ETC.

Item Sheets

Award Limits

Signature



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 11, 2003

Addendum No. 1

RE: Contract ID: C200874 (Combined Proposal No.3)
Work Order No. 6.589012T, 6.589016T
Montgomery, Richmond Counties (R-2231CA, R-2231CB)
US-220 Bypass From North of NC-73 to
Existing 4 Lanes North of US-220 Alternate.

July 22, 2003 Special Letting

To Whom It May Concern:

Reference is made to the Proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the proposal form:

On Page No. 149, the Project Special Provision entitled "Permits" has been revised.
Please void Page No. 149 in your proposal and staple the revised Page No. 149 thereto.

New Page Nos. P-1 thru P-156 are being added to include the 404 and 401 permits for the project. These permits apply to all sections of Project R-2231. The Contractor's bid shall take into consideration all terms and conditions specified in said permits. Please add new Page No. P-1 thru P-156 after Page No. 149 in your proposal.

The Table of Contents has been revised to reflect the above changes. Please void the Table of Contents in your proposal and staple the revised page thereto.

Each addendum package will contain an addendum letter and a copy of the permit for each of the 6 proposals (R-2231A, R-2231B, R-2231A&B, R-2231CA, R-2231CB and R-2231CA&CB) for your use. Please disregard any letter and copy of the permit for any project which you did not order.

Sincerely,

A handwritten signature in black ink, appearing to read "R. A. Garris".

R. A. Garris, P.E.
Contract Officer

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
CONTRACTS & PROPOSALS
1591 MAIL SERVICE CENTER
RALEIGH NC 27699-1591

TELEPHONE: 919-250-4124
FAX: 919-250-4127

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B - ENTRANCE B15
1020 BIRCH RIDGE DRIVE
RALEIGH NC

RAG/jag/pa

Attachments

Cc: Mr. J. D. Goins, P.E.
Mr. S. D. DeWitt, P.E.
Mr. W. F. Rosser, P.E.
Ms. D. M. Barbour, P.E.
Mr. J. V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Aydren Flowers
Mr. Ron Davenport, Jr., P.E.
Ms. Kim Canady
Ms. Yang Steelman
Project File (2)

PROJECT SPECIAL PROVISIONS
PERMITS

The Contractor's attention is directed to the following permits which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT**AUTHORITY GRANTING THE PERMIT**

Dredge and Fill and/or
Work in Navigable Waters

U. S. Army Corps of Engineers

Water Quality

Division of Environmental Management, DEHNR
State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the Standard Specifications and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the appropriate permit agency to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

Revised 7-11-03

PROJECT: 6.589012T, ETC.
MONTGOMERY / RICHMOND COUNTIES

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PROPOSAL SHEETS

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DEPARTMENT OF THE ARMY PERMIT

Permittee NC Department of Transportation

Permit No. 199400590

Issuing Office USAED, Wilmington

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Directly discharge dredged and/or fill material into Job's Creek, and tributaries to South Prong Creek, Bell's Creek, Rocky Ford Branch, Rocky Ford Creek, Naked Creek, Big Mountain Creek and Little Mountain Creek impacting a total of 7600 linear feet of streams and 29.8 acres of wetlands to facilitate the construction of the U.S. 220, Transportation Improvements Project (TIP) R-2231, State Project Number 8.T550803 and NC 73 Extension, TIP R-3303, State Project Number 8.1581201 and the discharge of dredged and/or fill material that may be required for the construction of the compensatory mitigation sites at Key Branch (Anson County), Myrick's Pond (Richmond County), and Haithcock Road (Montgomery County).

Project Location:

In the Lumber and Yadkin River basins, from the intersection of the existing four-lane roadway south of Ellerbe at SR 1448, in Richmond County, to the intersection of existing US 220 and US 220A, just south of Candor in Montgomery County, including the NC 73, 2-lane 24-foot extension from the intersection of US 220 and NC 73 and connecting with the new US 220 four-lane facility north of SR 1452 in Richmond County, North Carolina.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2006. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See enclosed sheet.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

- ☐ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
- ☒ Section 404 of the Clean Water Act (33 U.S.C. 1344).
- ☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

- a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.

- e. Damage claims associated with any future modification, suspension, or revocation of this permit.
4. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
 - a. You fail to comply with the terms and conditions of this permit.
 - b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
 - c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions.** General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Repsit 7/3/03
(PERMITTEE) (DATE)

NC DEPARTMENT OF TRANSPORTATION

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT ENGINEER) (DATE)

CHARLES R. ALEXANDER, JR. COLONEL

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) (DATE)

SPECIAL CONDITIONS (Action ID. 1994-0-0590; NCDOT/TIP R-2231 & 3303)

1. All work authorized by this permit must be prepared in strict compliance with the attached plans, which are a part of this permit.

2. The permittee shall mitigate for 29.8 acres of unavoidable impacts to riverine wetlands and for 7600 linear feet of impact to important streams, associated with the project, as follows:

a. The permittee shall mitigate for 423 linear feet of unavoidable impacts to an unnamed tributary to Big Mountain Creek (Section CB, Impact Site #3), an important stream channel, by completing 423 linear feet of onsite stream relocation, as described in the permit application. The stream relocation shall be constructed in accordance with the North Carolina Wildlife Resources Commission's (NCWRC) "Stream Relocation Guidelines", and with the attached permit drawings. NCDOT shall consult with NCWRC on all stream relocations and implement all practicable recommendations in the design of specific site requirements for re-establishment of bank vegetation, and placement of meanders and habitat structures. Vegetation shall be used to the maximum extent practicable to stabilize banks, and riprap and other man-made structural measures shall be minimized.

b. The permittee shall mitigate for 253 linear feet of unavoidable impacts to an unnamed tributary to Big Mountain Creek (Section CB, Impact Site #6), an important stream channel, by completing 253 linear feet of onsite stream relocation, as described in the permit application. The stream relocation shall be constructed in accordance with the North Carolina Wildlife Resources Commission's (NCWRC) "Stream Relocation Guidelines", and with the attached permit drawings. NCDOT shall consult with NCWRC on all stream relocations and implement all practicable recommendations in the design of specific site requirements for re-establishment of bank vegetation, and placement of meanders and habitat structures. Vegetation shall be used to the maximum extent practicable to stabilize banks, and riprap and other man-made structural measures shall be minimized.

c. In addition to the stipulation in items a. and b. above, the following stipulation shall also apply to these mitigation sites:

i. The permittee shall construct all channel relocations in a dry work area. The permittee shall stabilize the relocated channel before stream flows are directed into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Upon completion of the project, an as-built channel survey shall be conducted. It is recommended that stream surveys, for both project construction and project monitoring, follow the methodology contained in the USDA Forest Service Manual, *Stream Channel Reference Sites* (Harrelson, et.al, 1994). The survey should document the dimension, pattern and profile of the relocated channel.

ii. The permittee shall identify a stable reference reach that is close to the proposed relocation site and will not be impacted by the proposed highway construction. The applicant will coordinate a field meeting with the Corps of Engineers to approve the reference reach selection prior to channel design and relocation of the existing stream. Baseline data on the reference reach channel dimension, pattern, and profile shall be collected and used as a blueprint for the relocation channel design. A detailed design plan of the relocation stream shall be submitted to this office for review prior to construction, including clearing activities, at this site (Section C, Impact Site #4).

iii. Vegetation used to stabilize banks shall be limited to native woody species, and should include establishment of a 50 foot wide vegetated buffer on the relocated channel. Stream banks will be planted with native vegetation that represents both woody (trees and shrubs) and herbaceous species. Species selection will be based on a survey of the vegetation from the approved reference reach. Survival of woody species planted at the stream mitigation sites should be at least 320 trees/acre through year three. A ten percent mortality rate will be accepted in year four (288 trees/acre) and another ten percent in year five resulting in a required survival rate of 260 trees/acre through year five.

* iv. The permittee shall monitor the stream relocation mitigation site for a period of five years starting the year following construction. Monitoring data at the site should include the following: reference photos, plant survival and channel stability. Data shall be collected each year for 5 years at the same time of year. No less than two (2) bankfull flow events must be documented through the required 5-year monitoring period. If less than 2 bankfull events occur during the first 5 years, monitoring will continue until the second bankfull event is documented. The bankfull events must occur during separate monitoring years.

* v. If within any monitoring year, bank or stream stability is not acceptable as determined by the Corps of Engineers, and remedial action required by the Corps of Engineers is performed, the five-year monitoring period of the affected portions of the stream will start again at monitor year one. The permittee will coordinate all stream mitigation remedial activities with the Corps of Engineers, Wilmington District, prior to taking any remedial action. The permittee will submit a brief written report with representative photographs within 90 days after the monitoring year is completed.

vi. The permittee shall provide the Corps of Engineers, Wilmington District with a stream mitigation construction sequencing schedule within 30 days following the project preconstruction meeting. The plan, shall at a minimum, indicate a date of start of construction at the relocation site, grading schedule, planting schedule, completion of construction, monitoring schedule, and a date of potential diversion into the new channel.

* vii. The permittee and/or current and subsequent property owners shall maintain the mitigation site in its natural condition, as altered by work in the mitigation plan, in perpetuity. Prohibited activities within the mitigation site specifically include, but are not limited to: the construction or placement of roads, walkways, buildings, signs, or structures of any kind (i.e., billboards, interior fences, etc.); filling, grading, excavation, leveling, or any other earth

moving activity or activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation; disposal or storage of any debris, trash, garbage, or other waste material; except as may be authorized by the mitigation plan, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District. In addition, the permittee shall take no action, whether on or off the mitigation property, which will adversely impact the wetlands or streams on the mitigation property, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District.

* d. The permittee shall mitigate for 6924 linear feet of unavoidable impacts to important stream channel associated with this project by restoring 10,751 linear feet of stream channel in the Yadkin River Basin. 6,183 linear feet of perennial stream shall be restored at the Key Branch Mitigation Site in the Yadkin River Basin (Cataloging Unit 03040104). The stream restoration shall be constructed in accordance with the final mitigation plans that will be submitted and approved by the Corps of Engineers, Wilmington District prior to construction. The final plans should be based on the 60% design plans submitted to the Corps District on 6 September 2002. 4,568 linear feet of perennial stream shall be restored at the Haithcock Road Mitigation site in the Yadkin River Basin (Cataloging Unit 03040104). The stream restoration shall be constructed in accordance with the final mitigation plans that will be submitted and approved by the Corps of Engineers, Wilmington District prior to construction.

* e. The permittee shall mitigate for 351 linear feet of unavoidable impacts to important stream channel associated with this project by restoring 702 linear feet of stream channel in the Lumber River Basin (Cataloging Unit 03040203). The stream restoration shall be constructed at the Myrick's Pond Mitigation Site as identified in the Myrick's Pond Mitigation Plan, dated October 2002. The stream restoration shall be constructed in accordance with the final mitigation plans that will be submitted and approved by the Corps of Engineers, Wilmington District prior to construction.

f. In addition to the stipulation in items d. and e. above, the following stipulation shall also apply to these mitigation sites:

i. The proposed stream restoration design shall be based on an approved stable reference reach. Baseline data on the reference reach channel dimension, pattern, and profile shall be collected and used as a blueprint for the channel restoration design. A detailed final design plan of the stream restoration shall be submitted to the Corps of Engineers, Wilmington District for review and approval prior to construction.

* ii. The development of a monitoring plan for the design reach that would assesses geomorphologic and biological parameters will be required and shall be in keeping with "Stream Mitigation Guidelines", dated April 2003. The monitoring plan should include the protocol and provisions for providing reference photographs, channel stability analysis and biological data on a yearly basis. Reference photographs, both longitudinal and lateral, should be taken at least twice a year, preferably in winter and summer and at permanently established locations. Perpendicular transects or cross sections should be permanently established at

selected points on the designed reach where channel width, depth, cross-sectional area, and lateral photographs will be collected and provided in the annual monitoring reports. Cross sections shall be established once every 20 bank-full widths and will be divided evenly between riffle and pool bed features. Additional cross sections should be considered for areas where there are structures or other areas where there is a chance of failure.

✕ iii. An as-built plan will be required for the design reach. The as-built should also include longitudinal profile (three longitudinal profiles, each covering 20 bankfull-widths) data for the design reach, that should be monitored and data recorded annually. Design reach channel geometry measurements should also be a part of the as-built information. They will include sinuosity, meander wavelength, belt width, meander width ratio and radius of curvature. This plan should also show the location of all proposed attendant features, e.g. in-stream, bank protection or grade control structures, and the location of all sampling plots, transects, photography reference points, etc.

✕ g. The permittee shall mitigate for 2.1 acres of unavoidable impacts to riverine wetlands within the Lumber River Basin (Hydrologic Catalog Unit 03040203) by providing 2.5 acres of riverine wetland restoration at the Myrick's Pond Site as identified in the Myrick's Pond Mitigation Plan, dated October 2002. In addition, the following stipulations shall apply to this mitigation site:

i. The permittee shall identify a reference site that is adjacent to or near the proposed restoration site and will not be impacted by the proposed highway construction. The applicant will coordinate a field meeting with the Corps of Engineers to approve the reference site selection prior to final mitigation design and restoration of the mitigation site. Baseline data on the reference site hydrology, surface elevations, and vegetation shall be collected and used as a blueprint for the wetland restoration design. A detailed design plan of the wetland restoration shall be submitted to this office for review prior to construction, including clearing activities, at this site.

ii. To meet the success criteria, the monitoring data must show that for each normal precipitation year within the monitoring period, the site exhibits saturation within the upper 12 inches of the soil surface for a minimum of 12.5% or 28 days, or greater consecutive day duration during the growing season and inundation must occur 5 out of 10 years or 50% of the years monitored, at a minimum frequency. Baseline hydrologic data shall be obtained from the reference site, which can be used to support the mitigation site's hydrology success. WETS tables for Richmond County will be utilized as appropriate to determine normal precipitation years.

iii. If there are no normal precipitation years during the first five years of monitoring, to meet performance criteria, the permittee will continue to monitor hydrology on the site until it shows that the site has been inundated or saturated as described above during a normal precipitation year.

iv. The mitigation site shall be suitably graded to promote the establishment of planted wetland vegetation. If mineral soil is exposed at the desired restoration grade, the site should be graded to at least minus one-foot and brought back to grade by providing at least one foot of wetland topsoil. If organic soil is exposed at the desired restoration grade, the soil should be disked or suitability prepared for planting. Every effort must be made to utilize the topsoil from the impacted wetlands on this project to promote wetland re-vegetation.

v. The mitigation site will be planted with native vegetation that represents both woody (trees and shrubs) and herbaceous species. Species selection will be based on a survey of the vegetation from the approved reference site. Survival of woody species planted at the mitigation site must be at least 320 trees/acre through year three. A ten percent mortality rate will be accepted in year four (288 trees/acre) and another ten percent in year five resulting in a required survival rate of 260 trees/acre through year five.

vi. Vegetation monitoring must begin in the spring just after leaf-out. Permanent randomly located sample plots shall be established at the mitigation site. Plot size should be based on established standards for sampling vegetation planted at the target densities, usually 0.05 acre (50-foot X 50-foot). A minimum of three vegetation sampling plots shall be established at the site. After the first year of monitoring, the sample size (number of plots) shall be checked by use of statistical methods used to identify adequate sample size and if necessary adjusted. The planted tree stock shall be marked by use of tree marking paint and/or tree tags for identification and sampling. Plants that have colonized the sample plot should be identified and noted in the monitoring report but not used in the planted vegetation monitoring calculations. Plant recruitment should be calculated as a separate item and corrective measures may need to be taken if the volunteers are undesirable or are jeopardizing the survival of the planted stock. The measurement of planted stock survival using stem density will be acceptable provided that only planted stock is counted. In addition, in order to get an indication of health and vigor of the planted stock, general observations of lateral plant growth, leaf and bud development should also be annotated in the reports.

vii. Continually recording monitoring wells, surface gauges and/or piezometers shall be developed in the reference site and restoration site and be of sufficient numbers and adequately spaced to measure the extent, frequency and duration of the site inundation/saturation. This will aid in quickly identifying problem areas for remediation and determine the hydrologic success of the mitigation effort. The permittee must comply with USACE WRP Technical Note HY-IA3.1 for installation and development of the monitor wells and/or piezometers. Monitor wells shall be visited frequently to avoid lengthy down time of non-functioning wells and maintenance shall be scheduled in such a way as to minimize any down time for repairs or replacement. Lengthy down time of wells during the growing season may result in the extension of the monitoring period in order to fill in gaps in the data.

viii. The permittee and/or current and subsequent property owners shall maintain the mitigation site in its natural condition, as altered by work in the mitigation plan, in perpetuity. Prohibited activities within the mitigation site specifically include, but are not limited to: the construction or placement of roads, walkways, buildings, signs, or structures of any kind

(i.e., billboards, interior fences, etc.); filling, grading, excavation, leveling, or any other earth moving activity or activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation; disposal or storage of any debris, trash, garbage, or other waste material; except as may be authorized by the mitigation plan, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District. In addition, the permittee shall take no action, whether on or off the mitigation property, which will adversely impact the wetlands or streams on the mitigation property, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District.

✕ h. The permittee shall mitigate for 21 acres of unavoidable impacts to riverine wetlands and 6.7 acres of non-riverine wetlands within the Yadkin River Basin (Hydrologic Catalog Units 03040104 & 03040201) by restoring, at a minimum, 55.4 acres of riverine wetlands at the Key Branch Mitigation Site as described in the report entitled "Key Branch Wetland Mitigation Plan" dated August 24, 2001. In addition, the following stipulations shall apply to this mitigation site:

i. To meet the success criteria, the monitoring data must show that for each normal precipitation year within the monitoring period, the site exhibits saturation within the upper 12 inches of the soil surface for a minimum of 12.5% or 31 days, or greater consecutive day duration during the growing season and inundation must occur 5 out of 10 years or 50% of the years monitored, at a minimum frequency. Baseline hydrologic data shall be obtained from the reference site, which can be used to support the mitigation site's hydrology success. WETS tables for Moore County will be utilized as appropriate to determine normal precipitation years.

ii. The mitigation site will be planted with native vegetation that represents both woody (trees and shrubs) and herbaceous species. Species selection will be based on a survey of the vegetation from the reference sites. Survival of woody species planted at the mitigation site should be at least 320 trees/acre through year three. A ten percent mortality rate will be accepted in year four (288 trees/acre) and another ten percent in year five resulting in a required survival rate of 260 trees/acre through year five.

iii. Vegetation monitoring must begin in the spring just after leaf-out. Permanent randomly located sample plots shall be established at the mitigation site. Plot size should be based on established standards for sampling vegetation planted at the target densities, usually 0.05 acre (50-foot X 50-foot). A minimum of eight vegetation sampling plots shall be established at the site. After the first year of monitoring, the sample size (number of plots) shall be checked by use of statistical methods used to identify adequate sample size and if necessary adjusted. The planted tree stock shall be marked by use of tree marking paint and/or tree tags for identification and sampling. Plants that have colonized the sample plot should be identified and noted in the monitoring report but not used in the planted vegetation monitoring calculations. Plant recruitment should be calculated as a separate item and corrective measures may need to be taken if the volunteers are undesirable or are jeopardizing the survival of the planted stock. The measurement of planted stock survival using stem density will be acceptable provided that only planted stock is counted. In addition, in order to get an indication of health and vigor of the

planted stock, general observations of lateral plant growth, leaf and bud development should also be annotated in the reports.

iv. Continually recording monitoring wells, surface gauges and/or piezometers shall be developed in the reference sites (four wells) and restoration site (eight wells) and be adequately spaced to measure the extent, frequency and duration of the site inundation/saturation. This will aid in quickly identifying problem areas for remediation and determine the hydrologic success of the mitigation effort. The permittee must comply with USACE WRP Technical Note HY-IA3.1 for installation and development of the monitor wells and/or piezometers. Monitor wells shall be visited frequently to avoid lengthy down time of non-functioning wells and maintenance shall be scheduled in such a way as to minimize any down time for repairs or replacement. Lengthy down time of wells during the growing season may result in the extension of the monitoring period in order to fill in gaps in the data.

v. Except as described in the mitigation plan, no activities shall be initiated, conducted or allowed on the Key Branch Mitigation Site that may disturb, impair, alter, and/or modify the hydrology, vegetation and/or hydric soils of any of the existing wetland areas, including any restored wetlands.

✕ i. The permittee and/or current and subsequent property owners shall maintain the Key Branch Mitigation Site, Myrick's Pond Mitigation Site, Haithcock Road Stream Mitigation Site and the on-site mitigation sites in their natural conditions, as altered by work in the mitigation plans, in perpetuity. Prohibited activities within the mitigation sites specifically include, but are not limited to: the construction or placement of roads, walkways, pathways, buildings, signs, or structures of any kind (i.e., billboards, interior fences, etc.); filling, grading, excavating, leveling, or any other earth moving activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation; disposal or storage of any debris, trash, garbage, or other waste material; except as may be approved by the Corps of Engineers. In addition, the permittee and/or current and subsequent property owners shall take no action, whether on or off the mitigation properties, which will adversely impact the wetlands or streams on the mitigation sites, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District.

✕ j. The applicant shall protect all compensatory mitigation sites from future alterations by placing conservation covenants and restrictions running with the land and recorded with the deed, conveyance, or transfer. The Corps shall approve the language of conservation covenants and restrictions, prior to recordation. The applicant shall record the conservation covenants and restrictions within 4 months after obtaining the land interest. The conservation covenants and restrictions shall be recorded in the land records of their respective counties prior to the start of the mitigation construction of the mitigation sites. The applicant shall submit a copy of the fully executed and recorded deed, with the liber and folio number stamped, thereon, and property plat to the Corps within 30 days following recordation. Upon any offers for purchase, transfer, or grant of the mitigation sites, the purchaser, offerer, or grantee must receive notification that the covenants and restrictions are included in the deed. These covenants and

restrictions should include prohibitions against any discharges of dredged or fill material, permanent flooding, discharges of untreated stormwater, excavation, tree cutting, removal of vegetation, or construction within the area of easement, as displayed on the plat map which describes the property being conveyed, granted, or transferred, except as authorized by the Corps. The Corps shall approve any alteration of the language or restrictions in the covenants and restrictions.

3. When final design plans are completed for TIP R-2231 and R3303, any necessary permit modification requests shall be submitted to the Corps of Engineers and the North Carolina Division of Water Quality (NCDWQ). If necessary, a public notice describing the modifications and any additional impacts associated with the modifications will be circulated for public review and comment. Final design plans shall reflect all appropriate avoidance and minimization measures taken to lessen the project impacts on aquatic resources. The permittee shall submit a compensatory mitigation plan for proposed additional impacts within streams and wetlands associated with the proposed modifications. Construction within streams and wetlands on TIP R-2231 and R-3303 shall begin only after approval by the Corps of Engineers of the modified impacts.

4. Prior to commencing construction within jurisdictional waters of the United States for any portion of the proposed highway project, the permittee shall forward the latest version of project construction drawings to the Corps of Engineers, Wilmington Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings will be acceptable.

5. The permittee shall schedule a meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Wilmington Regulatory Field Office NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall notify the Corps of Engineers Project Manager a minimum of thirty (30) days in advance of the scheduled meetings in order to provide that individual with ample opportunity to schedule and participate in the required meetings.

6. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized landclearing at any time in the construction or maintenance of this project within waters and/or wetlands, or cause the degradation of waters and/or wetlands, except as authorized by this permit, or any modification to this permit. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project.

7. To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (*) of this permit, and shall require and maintain documentation of the location and characteristics of all borrow and disposal sites associated with

this project. This information will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with the preceding condition (*). All information will be available to the Corps of Engineers upon request. NCDOT shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work.

8. The permittee shall comply with the conditions specified in the water quality certification, No. 3419, issued by the North Carolina Division of Water Quality on April 1, 2003.

9. The permittee shall place the inverts of culverts and other structures greater than 48 inches in diameter in waters, streams, and wetlands one foot below the bed of the stream to allow low flow passage of water and aquatic life, unless providing passage would be impractical and the Corps of Engineers has waived this requirement. For culverts 48 inches in diameter or smaller, culverts must be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the culvert. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to, upstream or downstream of the structures.

10. The permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to assure compliance with the appropriate turbidity water quality standard (50 NTU's in all streams and rivers, and 25 NTU's in all lakes).

11. The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

12. The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.

13. If the permittee discovers any previously unknown historic or archeological remains while accomplishing the authorized work, he shall immediately stop work and notify the Wilmington District Engineer who will initiate the required State/Federal coordination.

14. No excavated or fill material shall be placed at any time in waters or wetlands outside the authorized permit area, nor will it be placed in any location or in any manner so as to impair surface water flow into or out of any wetland area.

15. The permittee shall maintain the authorized work in good condition and in conformance with the terms and conditions of this permit. The permittee is not relieved of this requirement if he abandons the permitted activity without transferring it to a third party.

16. All fill material shall be clean and free of any pollutants except in trace quantities. Metal products, organic materials, or unsightly debris will not be used.

17. This Department of the Army permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

18. In issuing this permit, the Federal Government does not assume any liability for:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future Federal activities initiated on behalf of the general public.
- c. Damages to other permitted or un-permitted activities or structures caused by the authorized activity.
- d. Design and construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.



Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

April 1, 2003

Dr. Gregory J. Thorpe, PhD, Manager
Planning and Environmental Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

Dear Dr. Thorpe:

Re: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act,
Proposed Ellerbe Bypass and Ellerbe Connector (NC 73 Extension) in Richmond and Montgomery Counties.
WQC Project No. 000874

Attached hereto is a copy of Certification No. 3419 issued to The North Carolina Department of Transportation dated April 1, 2003.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan W. Klimek". Below the signature, the text "Alan W. Klimek, P.E." is printed.

Alan W. Klimek, P.E.

Attachments

cc: Wilmington District Corps of Engineers
Corps of Engineers Wilmington Field Office
DWQ Fayetteville Regional Office
Central Files
File Copy



NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, Section .0500. This certification authorizes the NCDOT to place fill material in 29.81 acres of jurisdictional wetlands and 7600 linear feet of streams in Richmond and Montgomery Counties. The project shall be constructed pursuant to the application dated February 14, 2003 to construct the Ellerbe Bypass (TIP R-2231) and the Ellerbe Connector (TIP R-3303) in Richmond and Montgomery Counties and the impacts shall occur as described below.

Wetland Impacts in the Yadkin River Basin

Section	Riverine (acres)	Non-Riverine (acres)	Total (acres)
Section A	8.01	4.28	12.29
Section B	5.68	2.38	8.06
Section CA	0.00	0.00	0.00
Section CB	6.02	0.00	6.02
R-3303	1.32	0.00	1.32
Total	21.03	6.66	27.69

Wetland Impacts in the Lumber River Basin

Section	Riverine (acres)	Non-Riverine (acres)	Total (acres)
Section A	0.00	0.00	0.00
Section B	0.25	0.00	0.25
Section CA	1.87	0.00	1.87
Section CB	0.00	0.00	0.00
R-3303	0.00	0.00	0.00
Total	2.12	0.00	2.12

Surface Water Impacts for the Yadkin River Basin

Section	Stream Impacts (linear feet)	Natural Channel Design (linear feet)	Offsite Mitigation Requirement (1:1 Ratio)
Section A	2335	0	2335
Section B	1854	0	1854
Section CA	0	0	0
Section CB	2693	676	2017
R-3303	367	0	367
Total	7249	-676	6573



Surface Water Impacts for the Lumber River Basin

Section	Impacts (linear feet)	Ponds (acres)	On-Site Natural Channel Design (linear feet)	Mitigation Required
Section A	0	0		0
Section B	0	12.36	1066	-1066
Section CA	351	0		351
Section CB	0	0		0
R-3303	0	0		0
Total	351	12.36	1066	-715

The application provides adequate assurance that the discharge of fill material into the waters of Yadkin and Lumber River Basins in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your application, as described in the Public Notice. Should your project change, you are required to notify the DWQ and you may be required to submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire three years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding Corps of Engineers Permit, whichever is sooner.

Condition(s) of Certification:

1. Appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" or the "North Carolina Surface Mining Manual" whichever is more appropriate (available from the Division of Land Resources (DLR) in the DENR Regional or Central Offices) shall be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to assure compliance with the appropriate turbidity water quality standard (50 NTUs in all fresh water streams and rivers not designated as trout waters; 25 NTUs in all lakes and reservoirs, and all saltwater classes; and 10 NTUs in trout waters);
2. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within two months of the Division of Land Resources has released the project;



Michael F. Easley, Governor
 William G. Ross Jr., Secretary
 North Carolina Department of Environment and Natural Resources
 Alan W. Klimek, P.E. Director

3. If an environmental document is required, this Certification is not valid until a FONSI or ROD is issued by the State Clearinghouse. All water quality-related conditions of the FONSI or ROD shall become conditions of this Certification;
4. Measures shall be taken to prevent live or fresh concrete from coming into contact with waters of the state until the concrete has hardened;
5. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this permit without appropriate modification of this certification. Should waste or borrow sites be located in wetlands or stream, compensatory mitigation will be required since it is a direct impact from road construction activities.
6. All channel relocations will be constructed in a dry work area, and stabilized before stream flows are diverted. Channel relocations will be completed and stabilized prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Vegetation used for bank stabilization shall be limited to native woody species, and should include establishment of a 30 foot wide wooded and an adjacent 20 foot wide vegetated buffer on both sides of the relocated channel to the maximum extent practical. A transitional phase incorporating coir fiber and seedling establishment is allowable. Also, rip rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested.
- *7. Compensatory mitigation of 55.38 acres shall be done for 27.69 acres of impacts to jurisdictional wetlands in the Yadkin River Basin. In addition, 2.45 acres of compensatory mitigation shall be provided to offset 2.12 acres of jurisdictional wetlands in the Lumber River Basin. The mitigation shall be provided as described below.

Mitigation Site	Acres of WL Debited from Site	Type of Mitigation	River Basin	Acres of Mitigation Credited
Key Branch Mitigation Site	55.38	Restoration	Yadkin	55.38
Myrick Pond Mitigation Site	2.45	Restoration	Lumber	2.45
Total				57.83

8. For the construction activities for the bridge located from Station 190+00 to 191+53, the NCDOT shall strictly adhere to sediment and erosion control Best Management Practices as described for High Quality Waters entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) throughout design and construction of the project.



Michael F. Easley, Governor
 William G. Ross Jr., Secretary
 North Carolina Department of Environment and Natural Resources
 Alan W. Klimek, P.E. Director

9. Compensatory mitigation for impacts to streams shall be done for 7249 linear feet of stream impact in the Yadkin Basin and 351 linear feet of impact in the Lumber Basin, at a replacement ratio of 1:1. The mitigation shall be provided as described below.

Mitigation Site	Linear Feet of Streams Debited from Site	Type of Mitigation	River Basin	Acres of Mitigation Credited
Sites 3 & 6 in Section B	676	Onsite Restoration	Yadkin	676
Key Branch Mitigation Site	6183	Offsite Restoration	Yadkin	6183
Haithcock Mitigation Site	390	Offsite Restoration	Yadkin	390
Myrick Pond Site	351	Onsite Restoration	Lumber	351
Total				7600

- ✱ 10. A final plan for the Haithcock Mitigation Site shall be submitted, and written approval received from the NC Division of Water Quality, by October 1, 2003.
- ✱ 11. A final plan for the Key Branch Mitigation Site shall be submitted, and written approval received from the NC Division of Water Quality, by October 1, 2003.
12. No construction activities related to the section of the Ellerbe Connector (NC 73 Extension, TIP R-3303) located in Richmond County are authorized by this certification. Prior to any construction activities related to the Ellerbe Connector (NC 73 Extension, TIP R-3303) a modification to this certification is required. A submittal of a modification request, with seven copies, and corresponding fees will have to be submitted to the North Carolina Division of Water Quality.
- ✱ 13. Upon completion of the project, the NCDOT shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed. The responsible party shall complete the attached form and return it to the 401/Wetlands Unit of the Division of Water Quality upon completion of the project.
14. Placement of culverts and other structures in waters, streams, and wetlands must be placed below the elevation of the streambed to allow low flow passage of water and aquatic life unless it can be shown to DWQ that providing passage would be impractical. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in disequilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium shall be maintained if requested in writing by DWQ.
15. The permittee shall require its contractors (and/or agents) to comply with all of the terms of this certification, and shall provide each of its contractors (and/or agents) a copy of this certification.



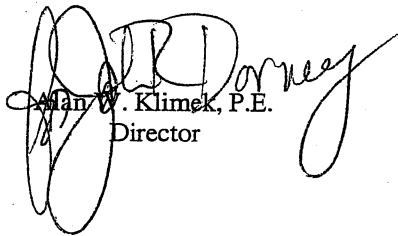
Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources
Alan W. Klimek, P.E. Director

Violations of any condition herein set forth shall result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, P.O. Box 27447, Raleigh, N.C. 27611-7447. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 1st day of April 2003

DIVISION OF WATER QUALITY


Alan W. Klimek, P.E.
Director

WQC No. 3419



Michael F. Easley, Governor
 William G. Ross Jr., Secretary
 North Carolina Department of Environment and Natural Resources
 Alan W. Klimek, P.E. Director

Certificate of Completeness

DWQ Project No.: _____ County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

* Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401/Wetlands Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1621. This form may be returned to DWQ by the applicant, the applicant's authorized agent, or the Project Engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____

Date: _____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____

Date: _____

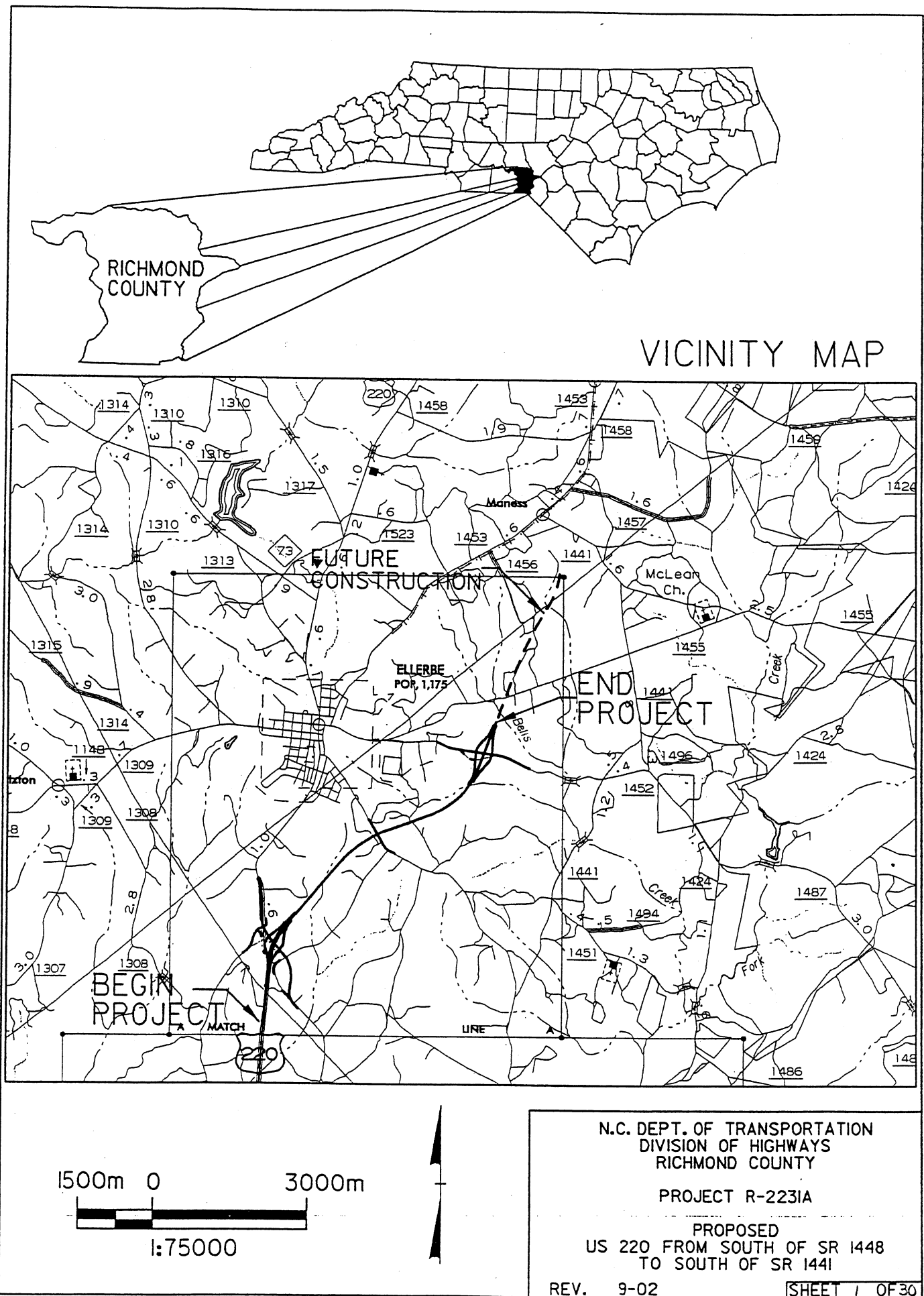
If this project was designed by a Certified Professional

I, _____, as a duly registered Professional _____ (i.e., Engineer, Landscape Architect, Surveyor, ect.) in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature _____

Registration No. _____

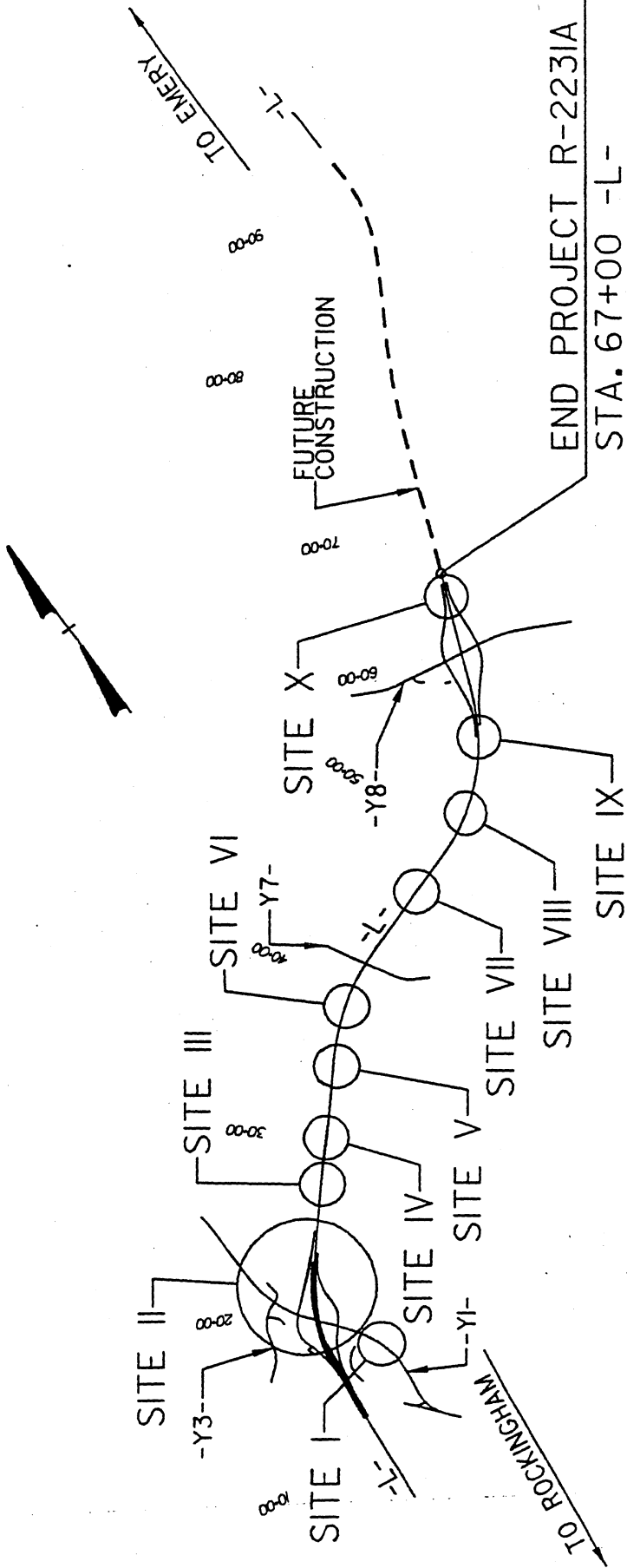
Date _____



WETLAND LEGEND

	WETLAND BOUNDARY		PROPOSED BRIDGE
	WETLAND		PROPOSED BOX CULVERT
	DENOTES FILL IN WETLAND		PROPOSED PIPE CULVERT
	DENOTES FILL IN SURFACE WATER	(DASHED LINES DENOTE EXISTING STRUCTURES)	
	DENOTES FILL IN SURFACE WATER (POND)	12"-48" PIPES	
	DENOTES TEMPORARY FILL IN WETLAND	54" PIPES & ABOVE	
	DENOTES EXCAVATION IN WETLAND		SINGLE TREE
	DENOTES TEMPORARY FILL IN SURFACE WATER		WOODS LINE
	DENOTES MECHANIZED CLEARING		DRAINAGE INLET
	FLOW DIRECTION		ROOTWAD
	TOP OF BANK		RIP RAP
	EDGE OF WATER		ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
	PROP. LIMIT OF CUT		PREFORMED SCOUR HOLE (PSH)
	PROP. LIMIT OF FILL		LEVEL SPREADER (LS)
	PROP. RIGHT OF WAY		GRASS SWALE
	NATURAL GROUND		
	PROPERTY LINE		
	TEMP. DRAINAGE EASEMENT		
	PERMANENT DRAINAGE EASEMENT		
	EXIST. ENDANGERED ANIMAL BOUNDARY		
	EXIST. ENDANGERED PLANT BOUNDARY		
	WATER SURFACE		
	LIVE STAKES		
	BOULDER		
	CORE FIBER ROLLS		

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT R-2231A
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441



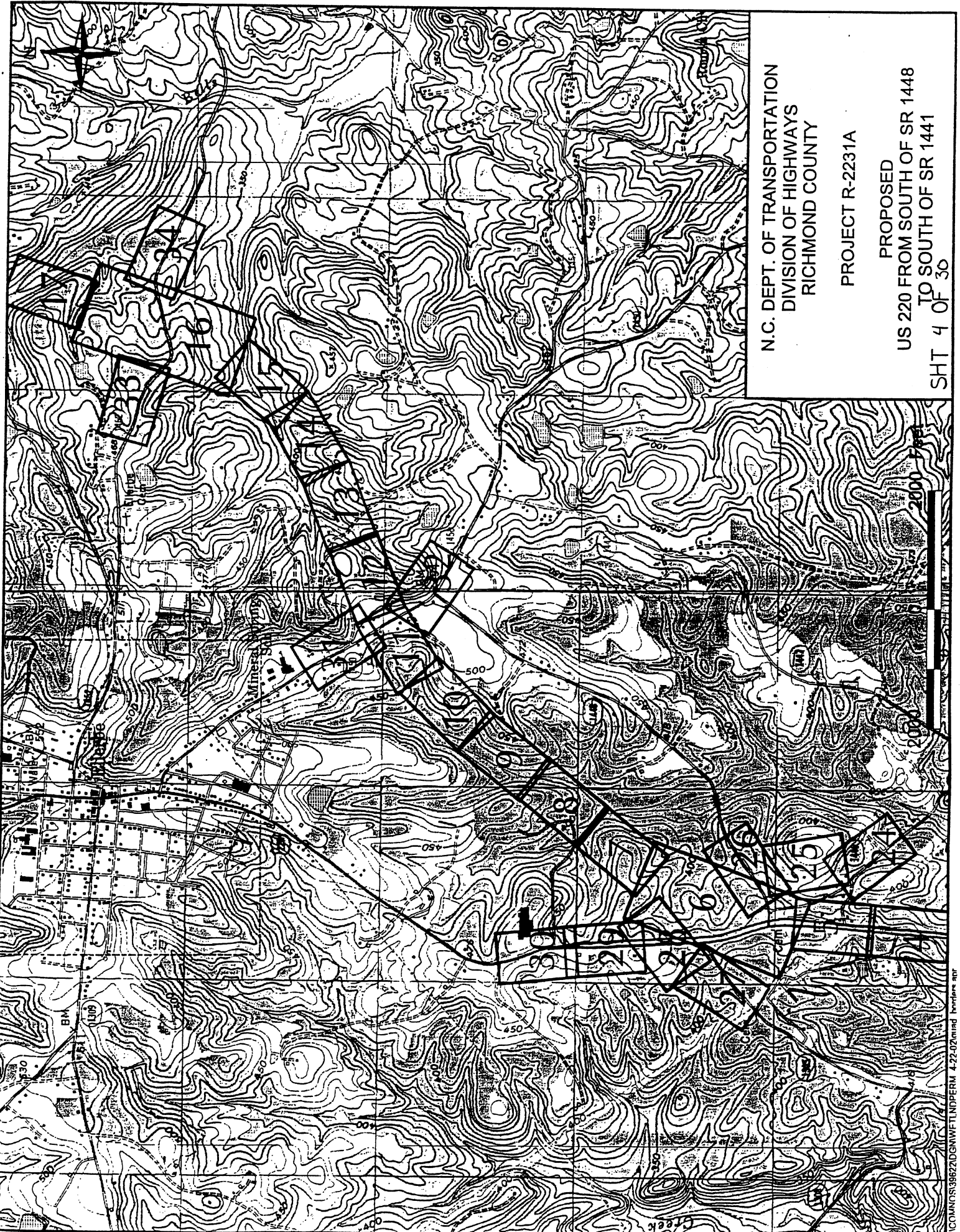
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-223IA

PROPOSED
US 220 FROM SOUTH OS SR 1448
TO SOUTH OF SR 144I

REV. 9-02

SHEET 3 OF 30



N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

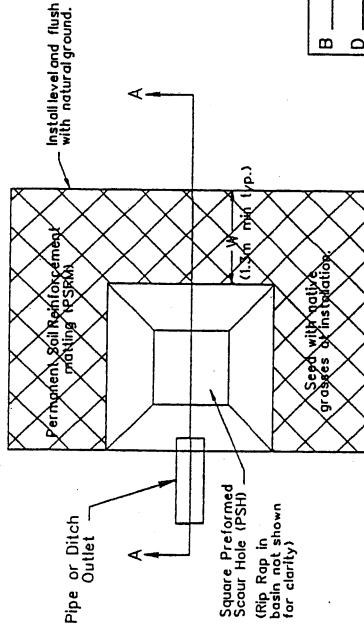
PROPOSED

US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

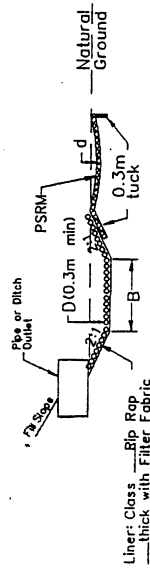
SHT 4 OF 30

PREFORMED SCOUR HOLE WITH
LEVEL SPREADER APRON

PLAN VIEW



SECTION A-A



PSH LOCATIONS	B	D	W	d	DIMENSIONS
-L- STA. 29+65 RT.	1	0.22m	1.3m	0.15m	3.6mx4.9m
-L- STA. 38+40 RT.	1	0.20m	1.3m	0.15m	7mx9m
-L- STA. 46+80 LT.	1	0.30m	1.3m	0.15m	6mx7m
-L- STA. 52+40 LT.	1	0.20m	1.3m	0.15m	7mx9m
-Y5- STA. 10+55 RT.	1	0.30m	1.3m	0.15m	7mx9m

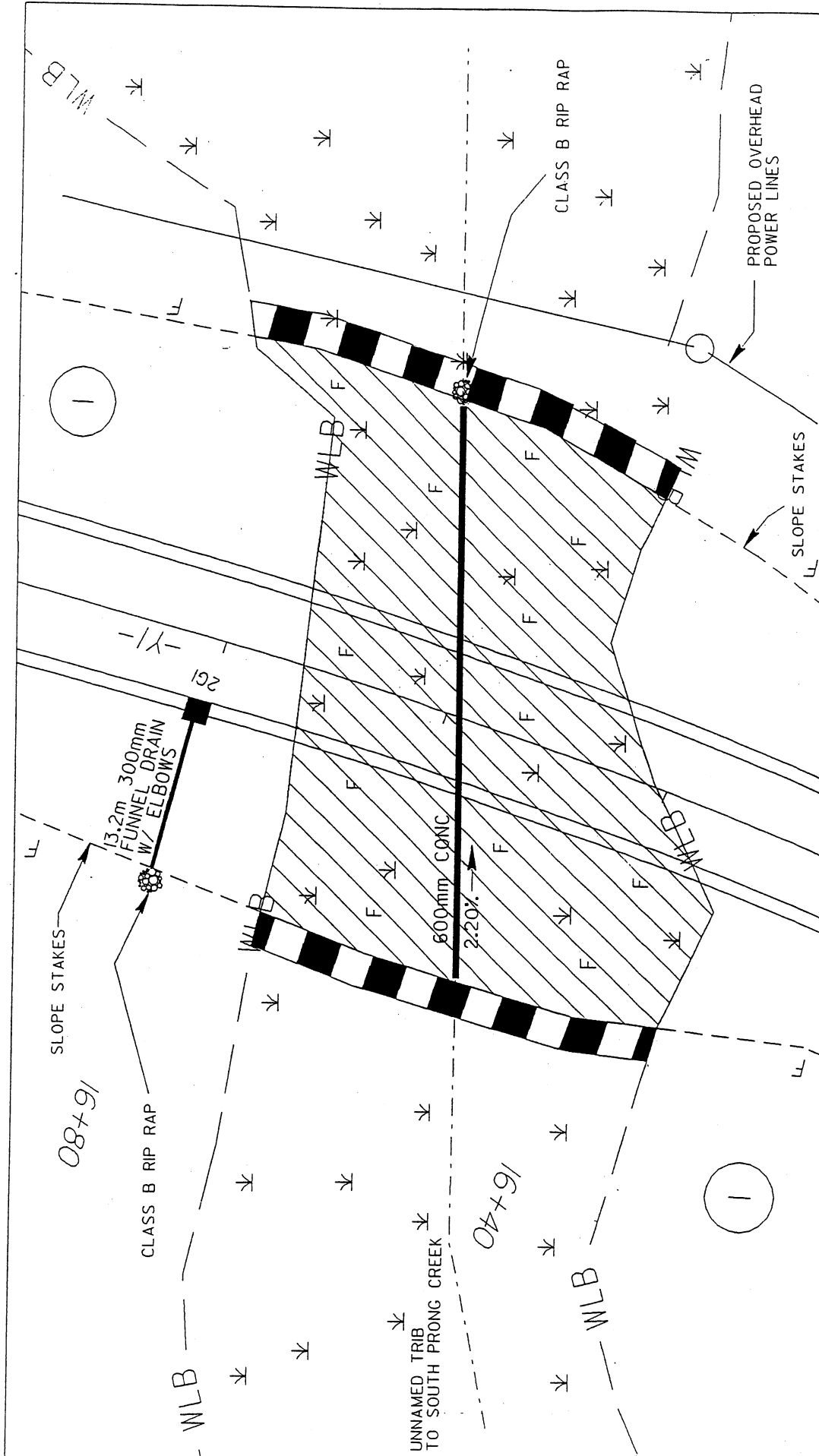
PREFORMED SCOUR HOLE DETAIL

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 11-18-02 SHEET 5 OF 30



PLAN VIEW - SITE 1

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

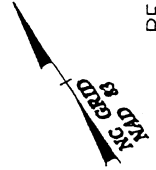
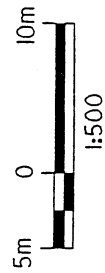
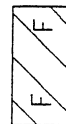
PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

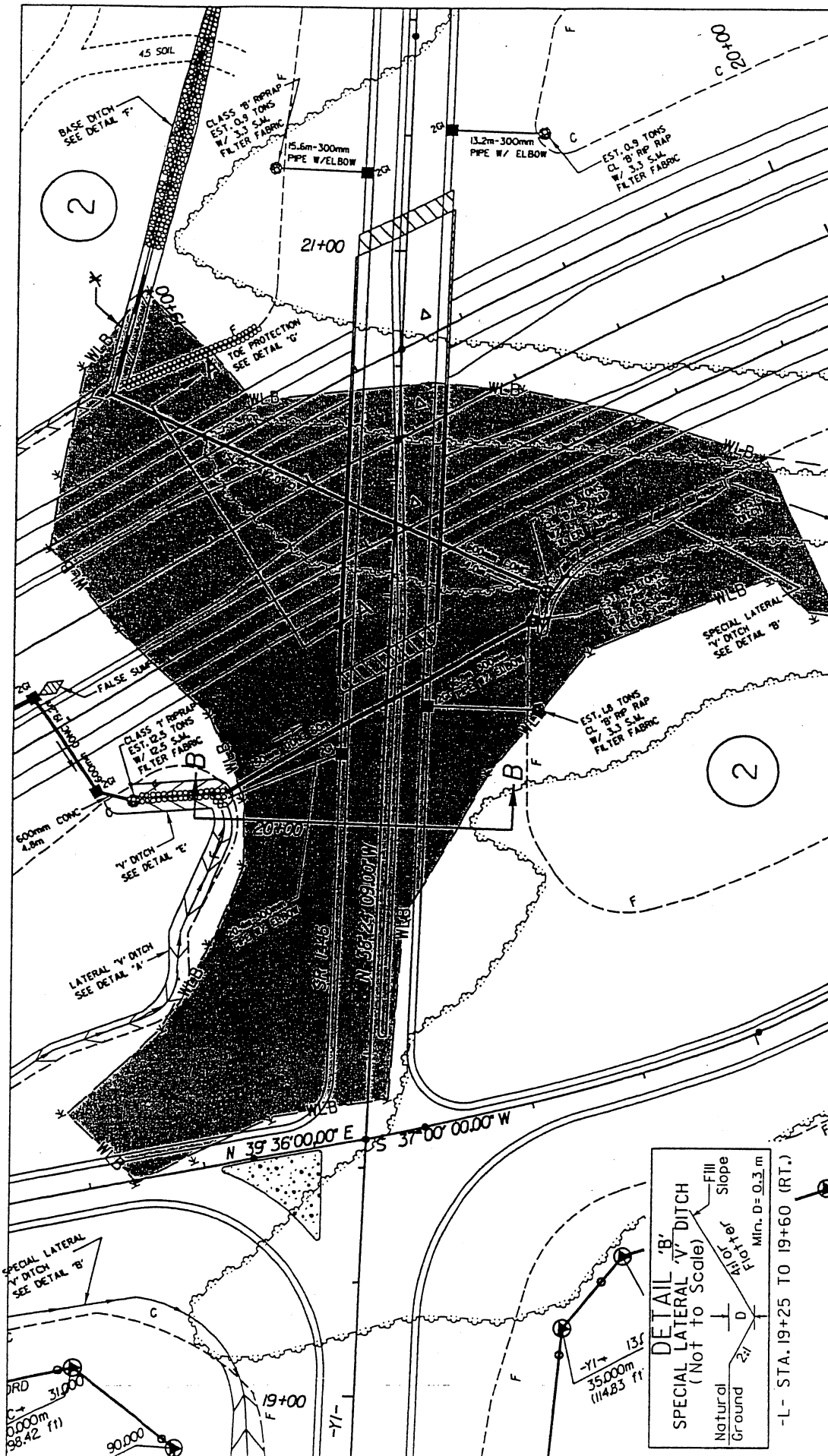
SHEET 6 OF 30

REV 10/02

DENOTES FILL IN WETLANDS

DENOTES MECHANIZED
CLEARING IN WETLANDS





N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

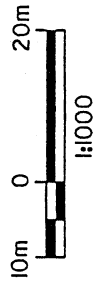
REV. 9-02

PLAN VIEW - SITE IIA

- NO EXCAVATION AT WBL STA. 19+40 RT. DUE TO TOTAL WETLAND IMPACT.

DENOTES FILL IN WETLANDS

- NO MECHANIZED CLEARING AT WBL STA. 18+80 LT. AND 19+40 RT. DUE TO TOTAL WETLAND IMPACT.



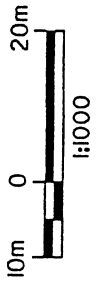
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REV. 9-02

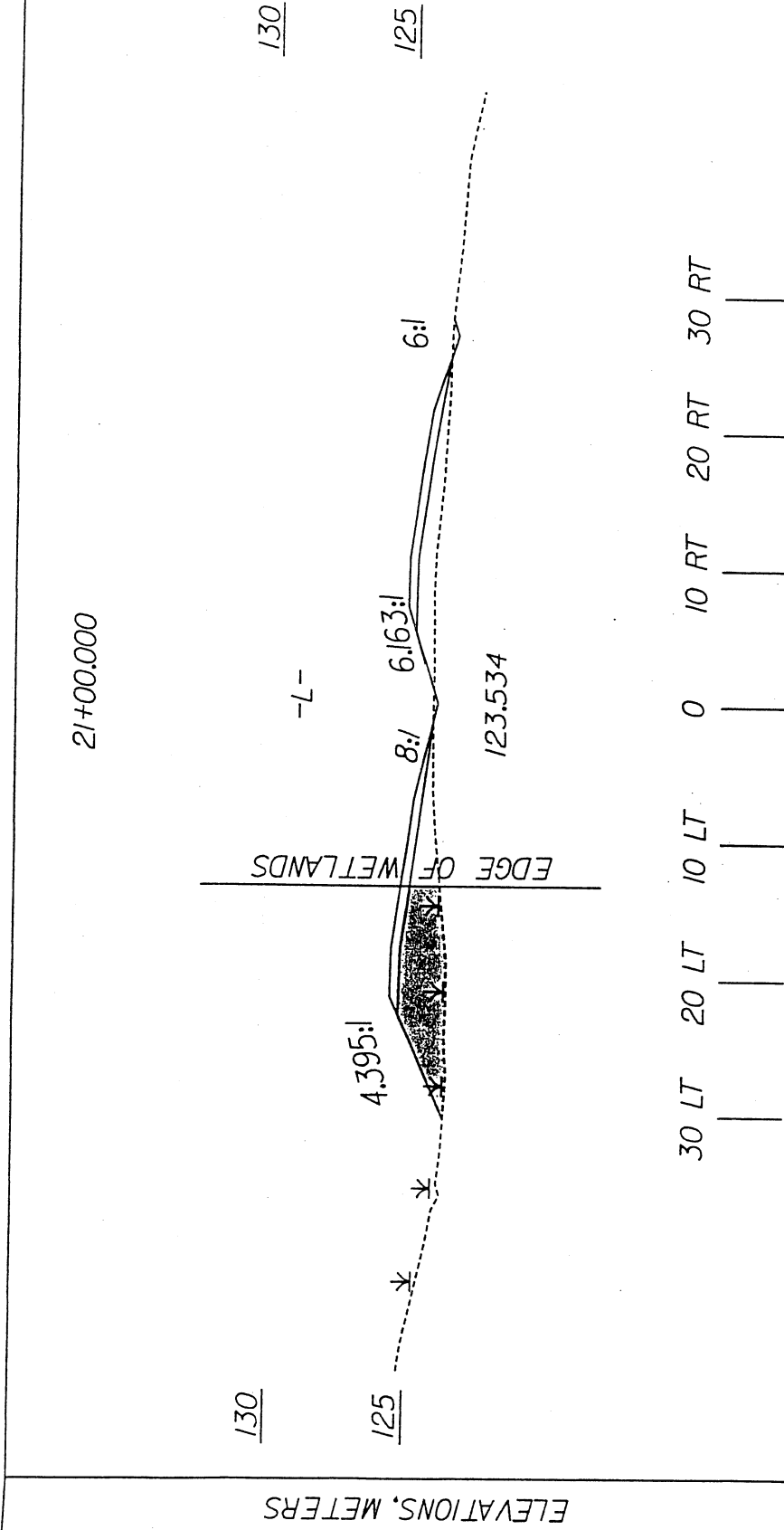
SHEET 8 OF 30

PLAN VIEW - SITE IIB

DENOTES FILL SURFACE WATERS



M007-92-0641-01 \ VMDG \ 22965 \ SCANNING \



SECTION -D- SITE IIB

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 148
TO SOUTH OF SR 141

REV. 9-02

SHEET 9 OF 30

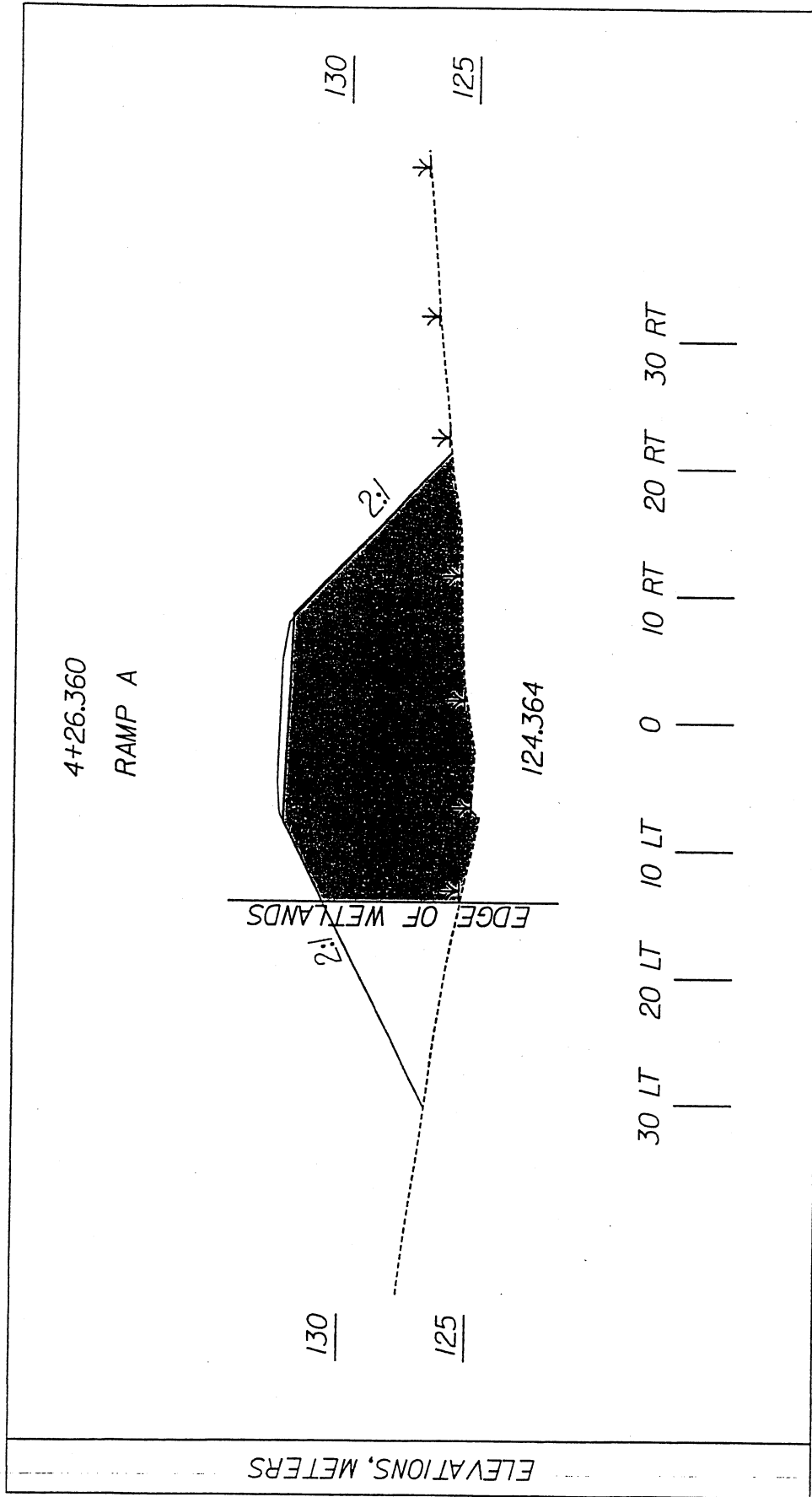
DENOTES FILL IN WETLANDS

HORIZONTAL SCALE: 1:500

2.5m 0 5m

VERTICAL SCALE: 1:250

J:\COMMONS\39622\DCM\WFE\TLNO28.DCM



SECTION -E- SITE IIB

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 10 OF 20

DENOTES FILL IN WETLANDS

HORIZONTAL SCALE: 1:500

VERTICAL SCALE: 1:250

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT R-2231A

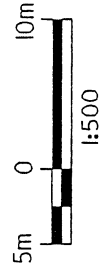
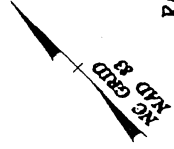
PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

SHEET 11 OF 30

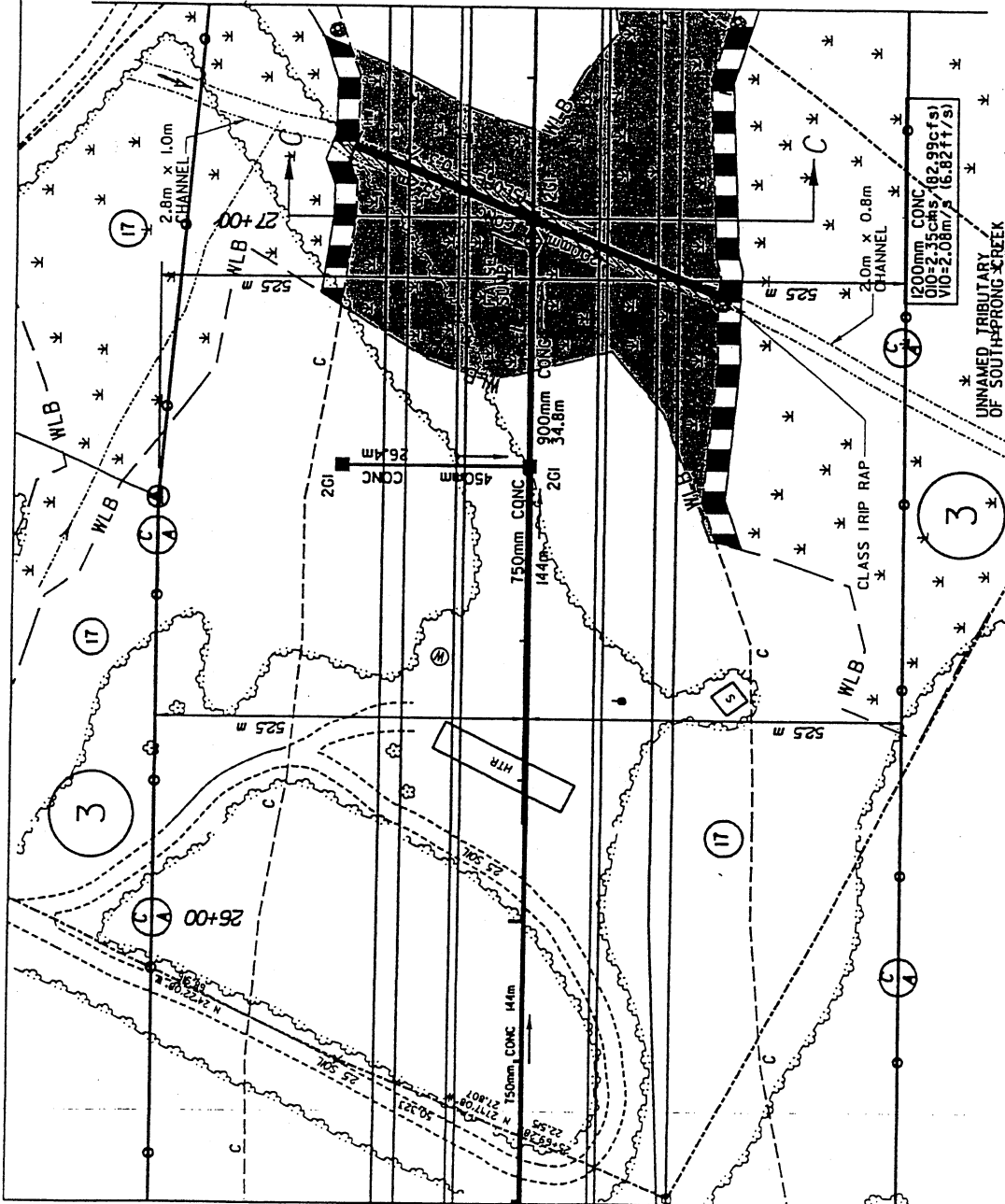
REV. 9/02

DENOTES UNDERCUT IN WETLANDS

DENOTES MECHANIZED TEMPORARY
CLEARING IN WETLANDS



MATCH LINE STA. 27+30
(SEE SHEET --)



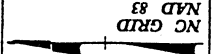
PLAN VIEW - SITE III

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 12 OF 30



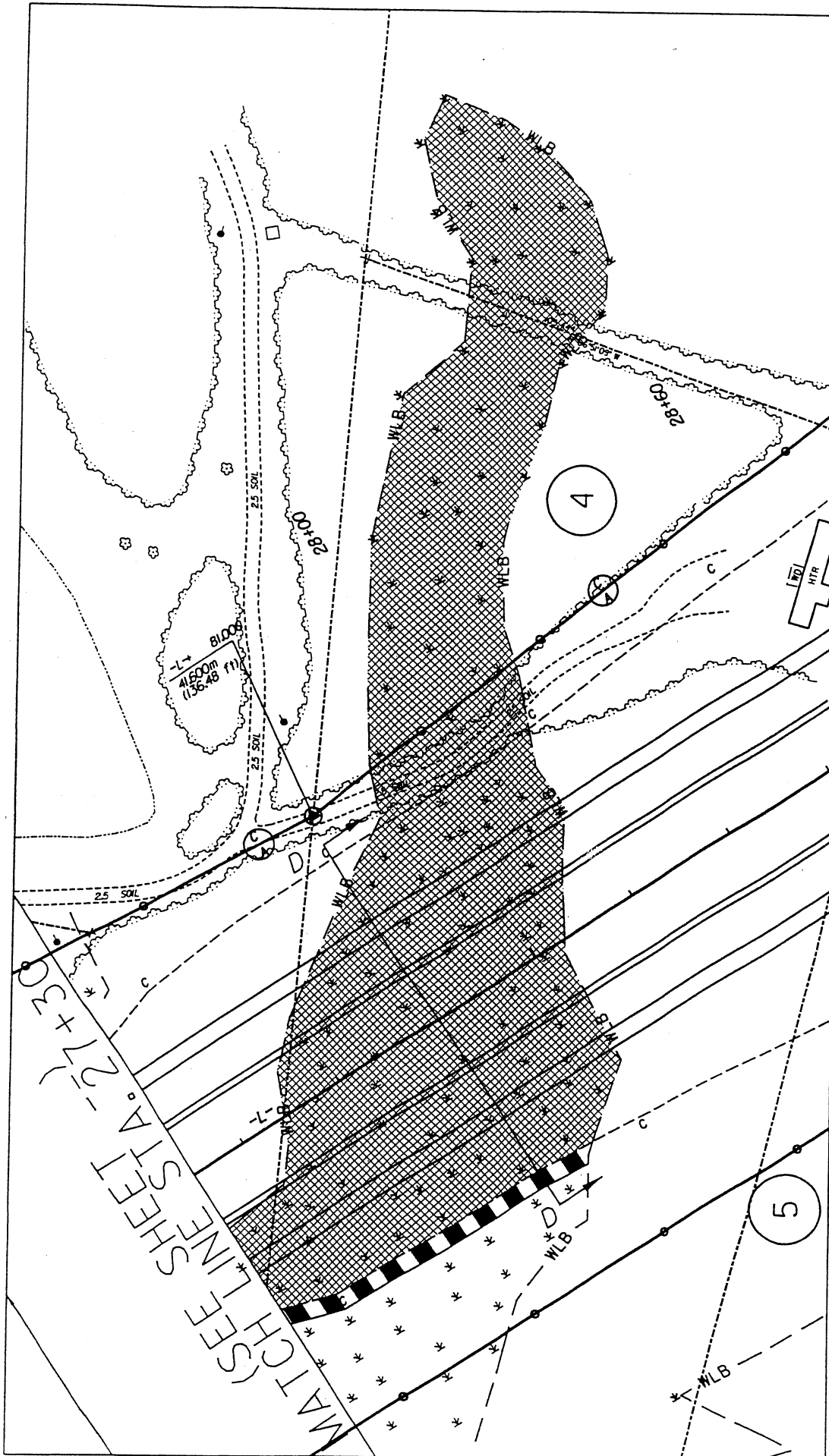
||||| DENOTES FILL SURFACE WATERS



DENOTES FILL IN WETLANDS



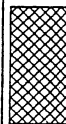
DENOTES MECHANIZED
CLEARING IN WETLANDS



PLAN VIEW - SITE III(CONTINUED)

DENOTES UNDERCUT IN WETLANDS

DENOTES MECHANIZED
CLEARING IN WETLANDS

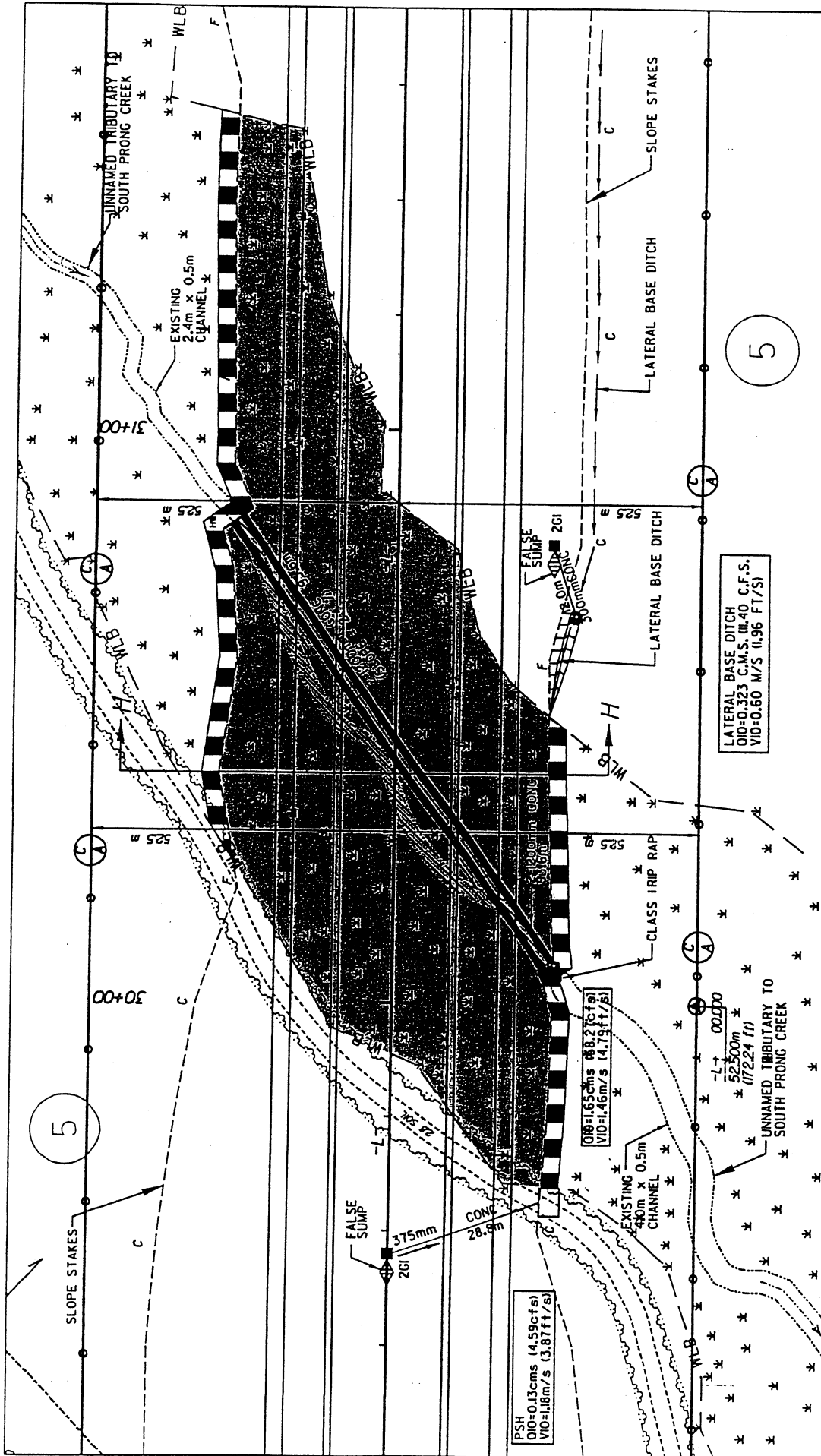


N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 13 OF 30



PLAN VIEW - SITE IV

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02

SHEET 14 OF 30



DENOTES FILL IN WETLANDS

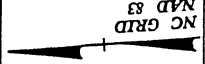


DENOTES MECHANIZED
CLEARING IN WETLANDS

DENOTES FILL SURFACE WATERS



1:1000



LATERAL BASE DITCH
Q10=0.323 C.M.S. (11.40 C.F.S.)
V10=0.60 M/S (1.96 FT/S)

Q10=1.65cms (4.59cfs)
V10=1.46m/s (4.79ft/s)

PSH
Q10=0.13cms (4.59cfs)
V10=1.18m/s (3.87ft/s)

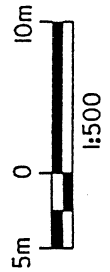
PLAN VIEW - SITE V

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02

SHEET 15 OF 30

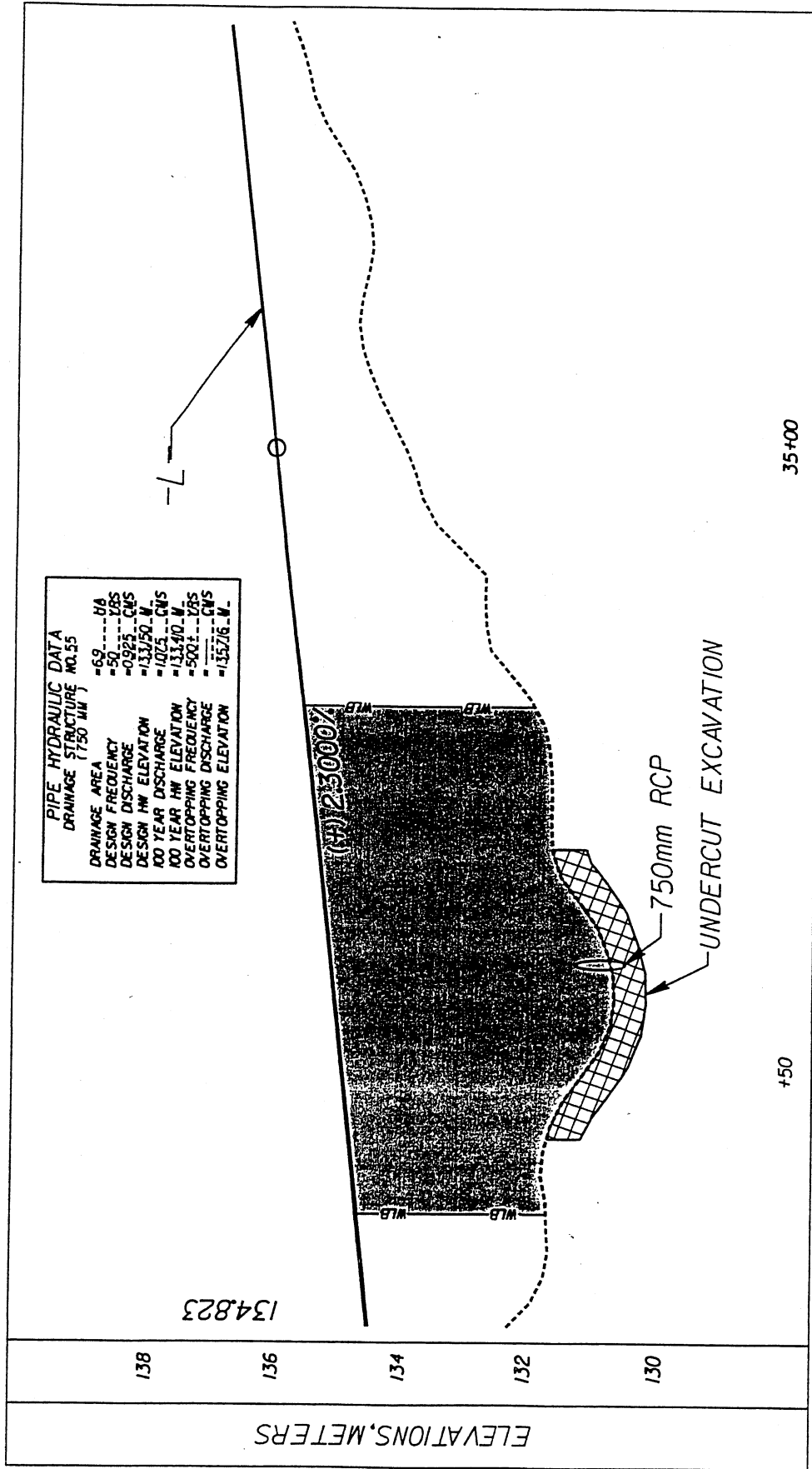
NC GRID
NAD 83




DENOTES FILL IN WETLANDS

DENOTES MECHANIZED
CLEARING IN WETLANDS

J:\COMMONS\J9622\DCN\NINETEEN05.DCN



PROFILE VIEW - SITE V - L -


 DENOTES FILL IN WETLANDS

HORIZONTAL SCALE: 1:500
 VERTICAL SCALE: 1:100

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RICHMOND COUNTY

PROJECT R-2231A

PROPOSED

US 220 FROM SOUTH OF SR 1448
 TO SOUTH OF SR 1441

REV. 9-02 SHEET 16 OF 30

34+60.000

140

135

130

140

135

130

8:1 8:1

2:1

2:1

131.397

30 LT 20 LT 10 LT 0 10 RT 20 RT 30 RT

SECTION -L- SITE V



DENOTES FILL IN WETLANDS

5m 0 10m

HORIZONTAL SCALE: 1:500

2.5m 0 5m

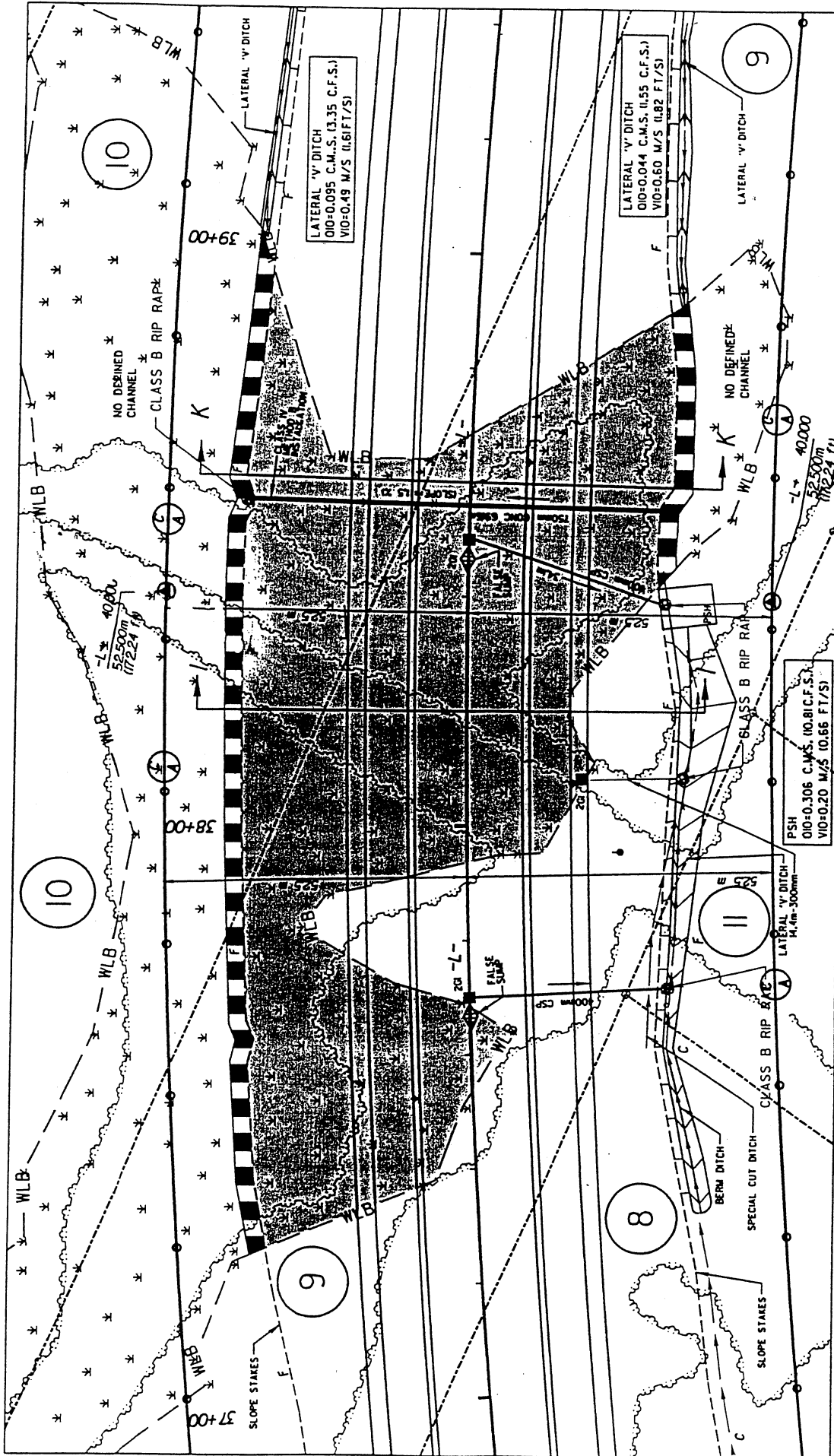
VERTICAL SCALE: 1:250

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY



PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 17 OF 30



PLAN VIEW - SITE VI

-  DENOTES FILL IN WETLANDS
-  DENOTES MECHANIZED CLEARING IN WETLANDS



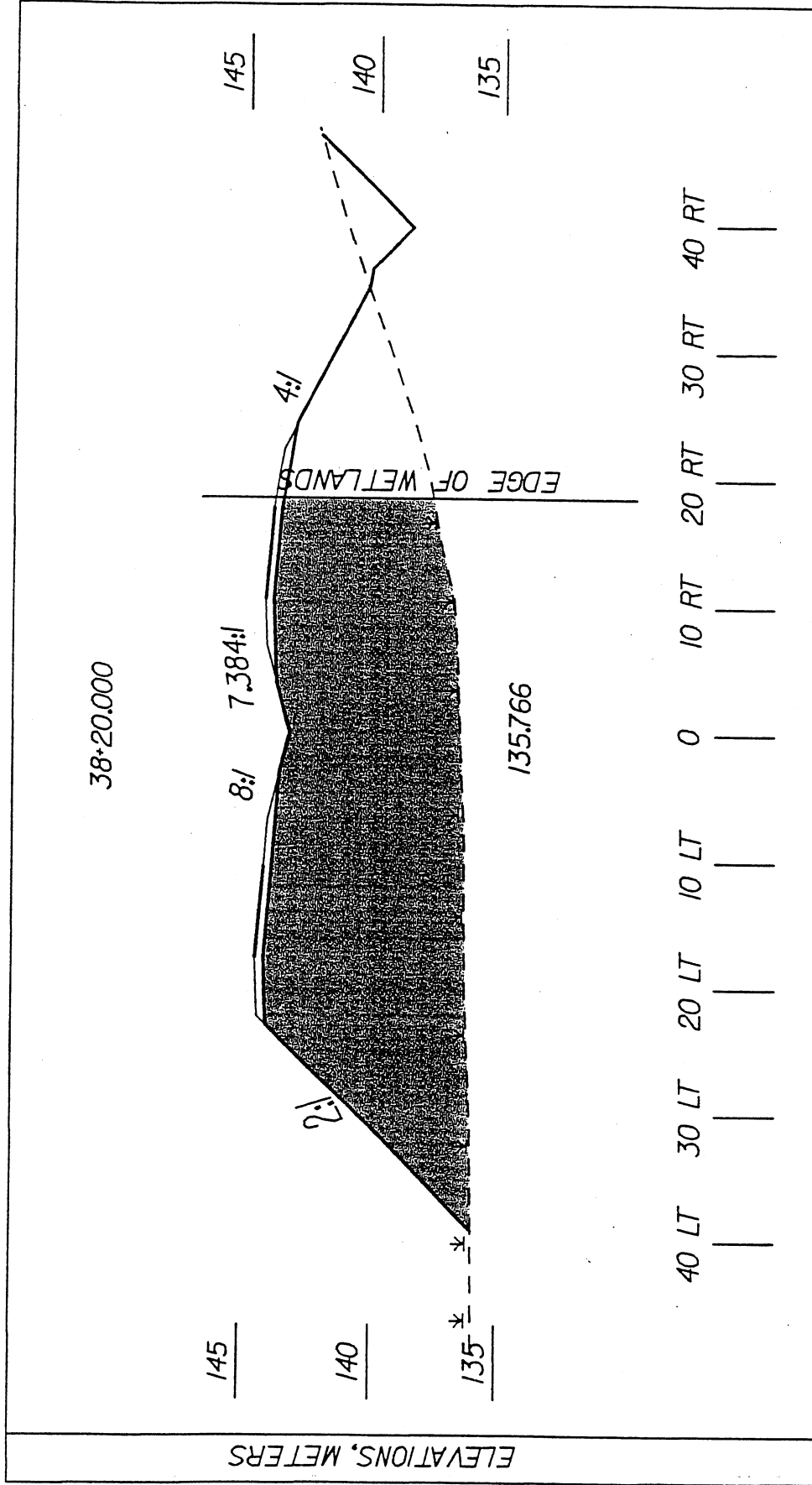
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02

SHEET 18 OF 30



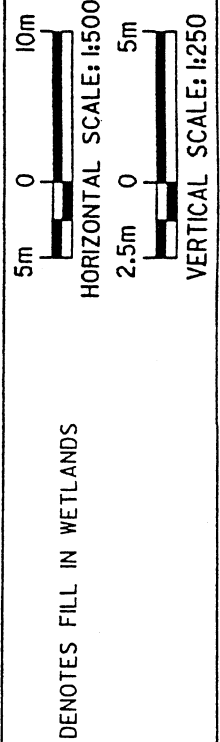
SECTION -- SITE VI

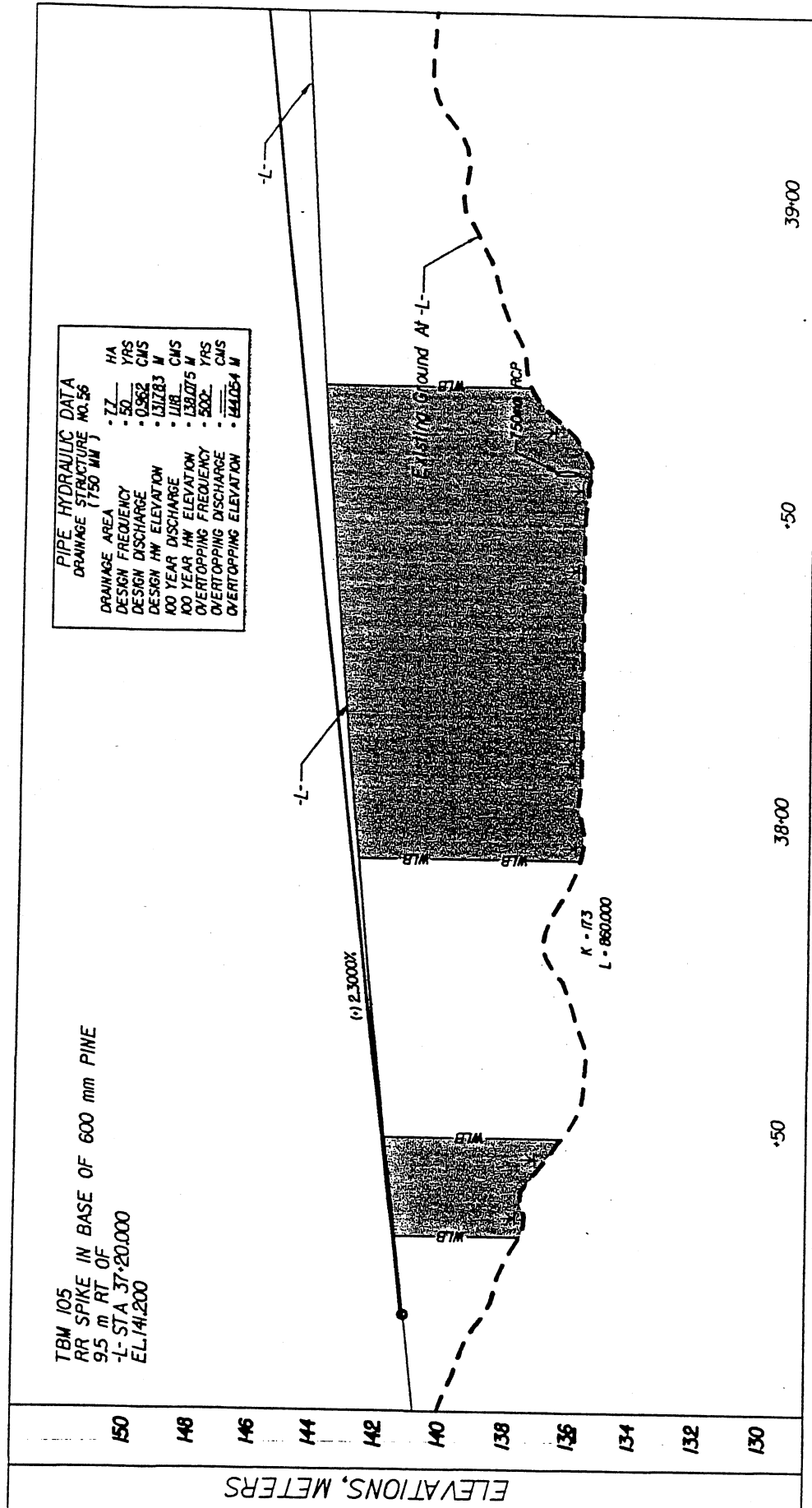
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 19 OF 20





PROFILE VIEW - SITE VI

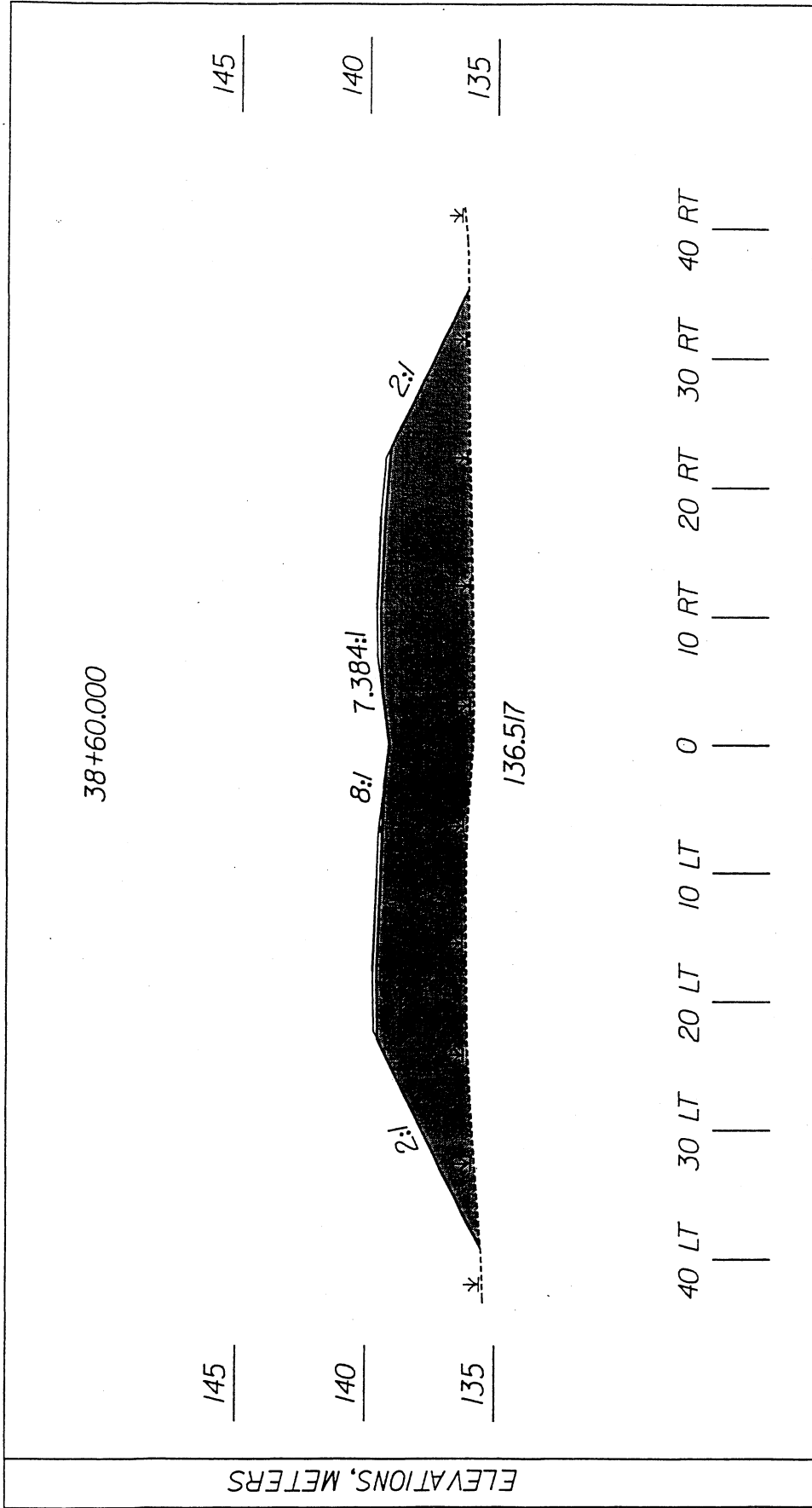
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

DENOTES FILL IN WETLANDS

PROJECT R-2231A

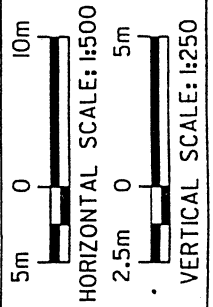
PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 20 OF 30



SECTION -K- SITE VI

DENOTES FILL IN WETLANDS



N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

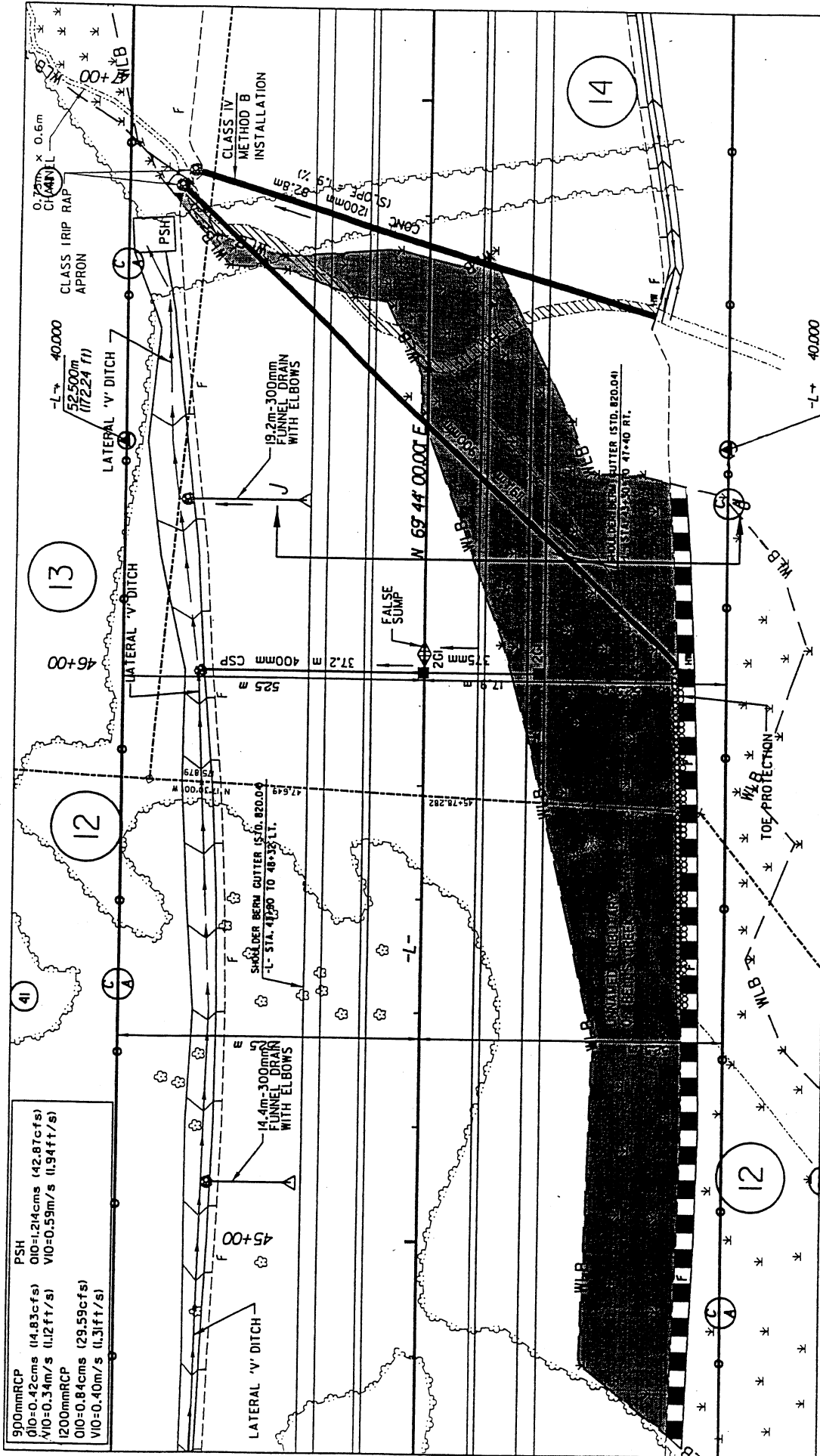
PROJECT R-2231A

PROPOSED

US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02

SHEET 21 OF 30



PLAN VIEW - SITE VIII

DENOTES FILL IN WETLANDS

DENOTES MECHANIZED
CLEARING IN WETLANDS

DENOTES FILL SURFACE WATERS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

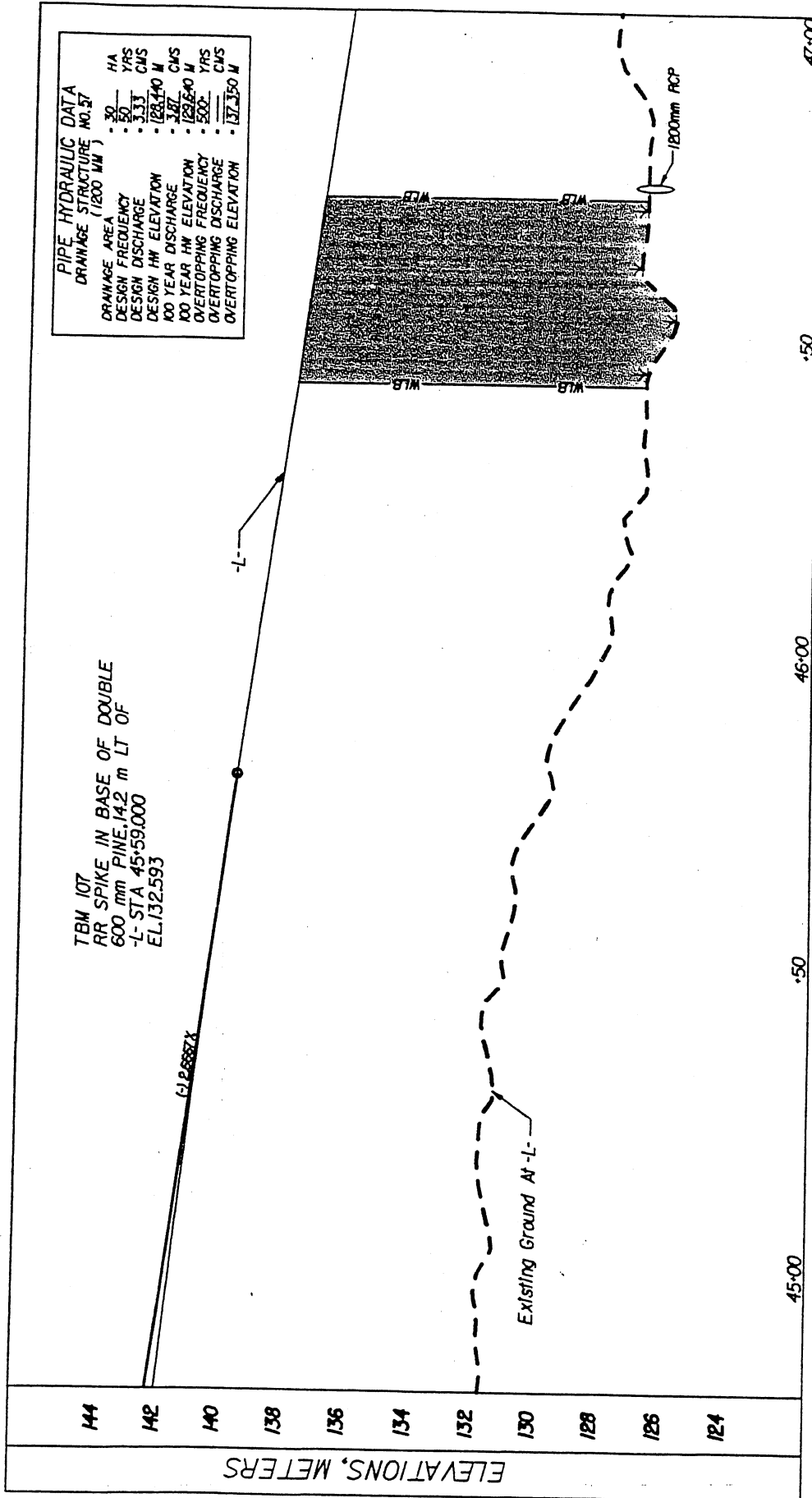
PROPOSED

US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02

SHEET 22 OF 30

J:\CUMMUS\39622\UGA\NINE\17AUG07.DGN



PROFILE VIEW - SITE VII



N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RICHMOND COUNTY

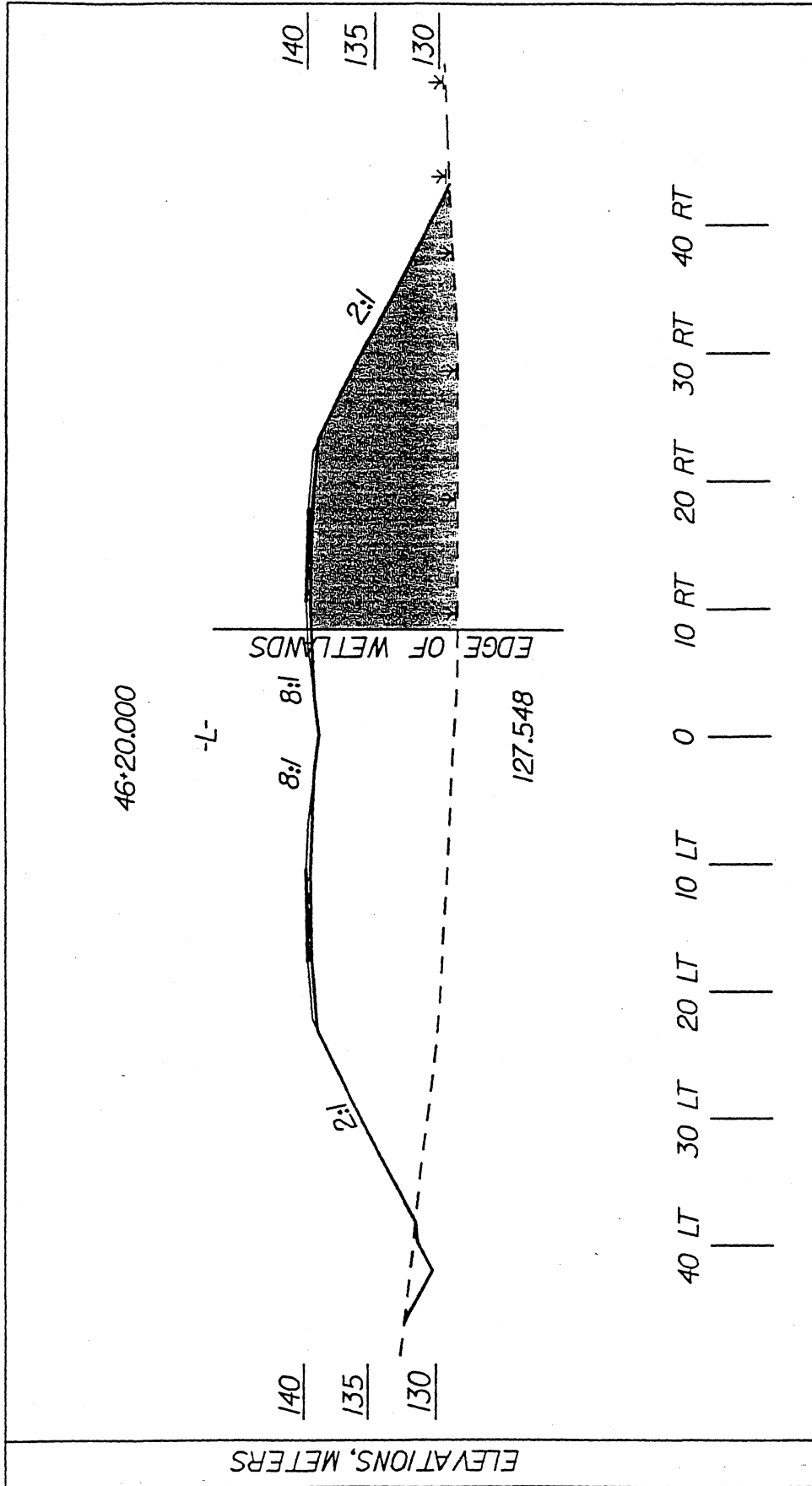
PROJECT R-2231A

PROPOSED

US 220 FROM SOUTH OF SR 1448
 TO SOUTH OF SR 1441

REV. 9-02

SHEET 23 OF 30



SECTION -J- SITE VII

■ DENOTES FILL IN WETLANDS

10m 0 20m

HORIZONTAL SCALE: 1:500

10m 0 20m

VERTICAL SCALE: 1:500

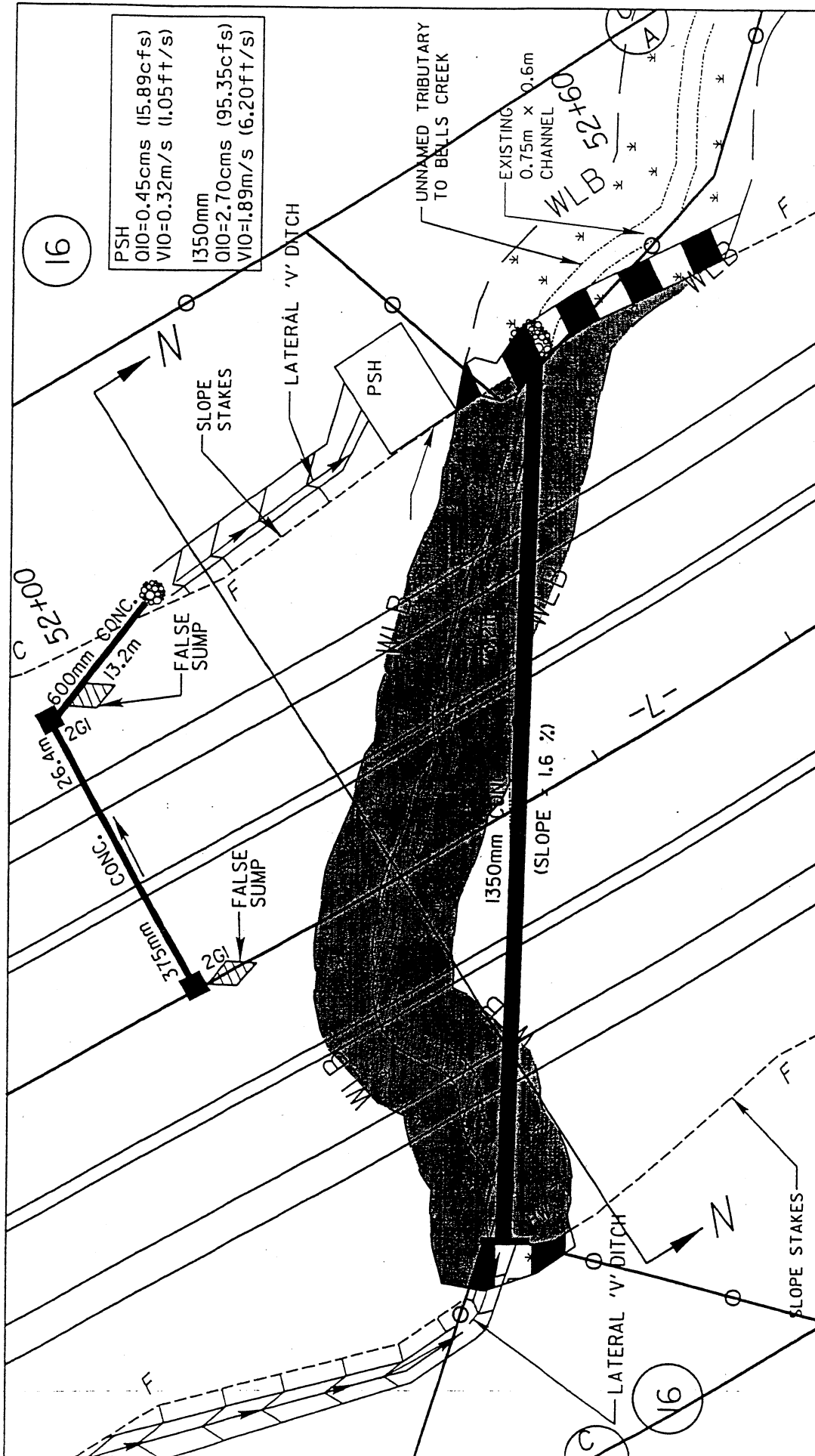
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A




PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

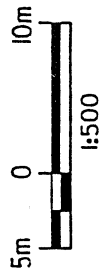
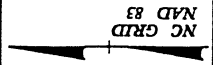
REV. 9-02

SHEET 24 OF 30



PLAN VIEW - SITE VIII

- | | |
|---|--|
|  | DENOTES FILL IN WETLANDS |
|  | DENOTES FILL SURFACE WATERS |
|  | DENOTES MECHANIZED
CLEARING IN WETLANDS |



N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

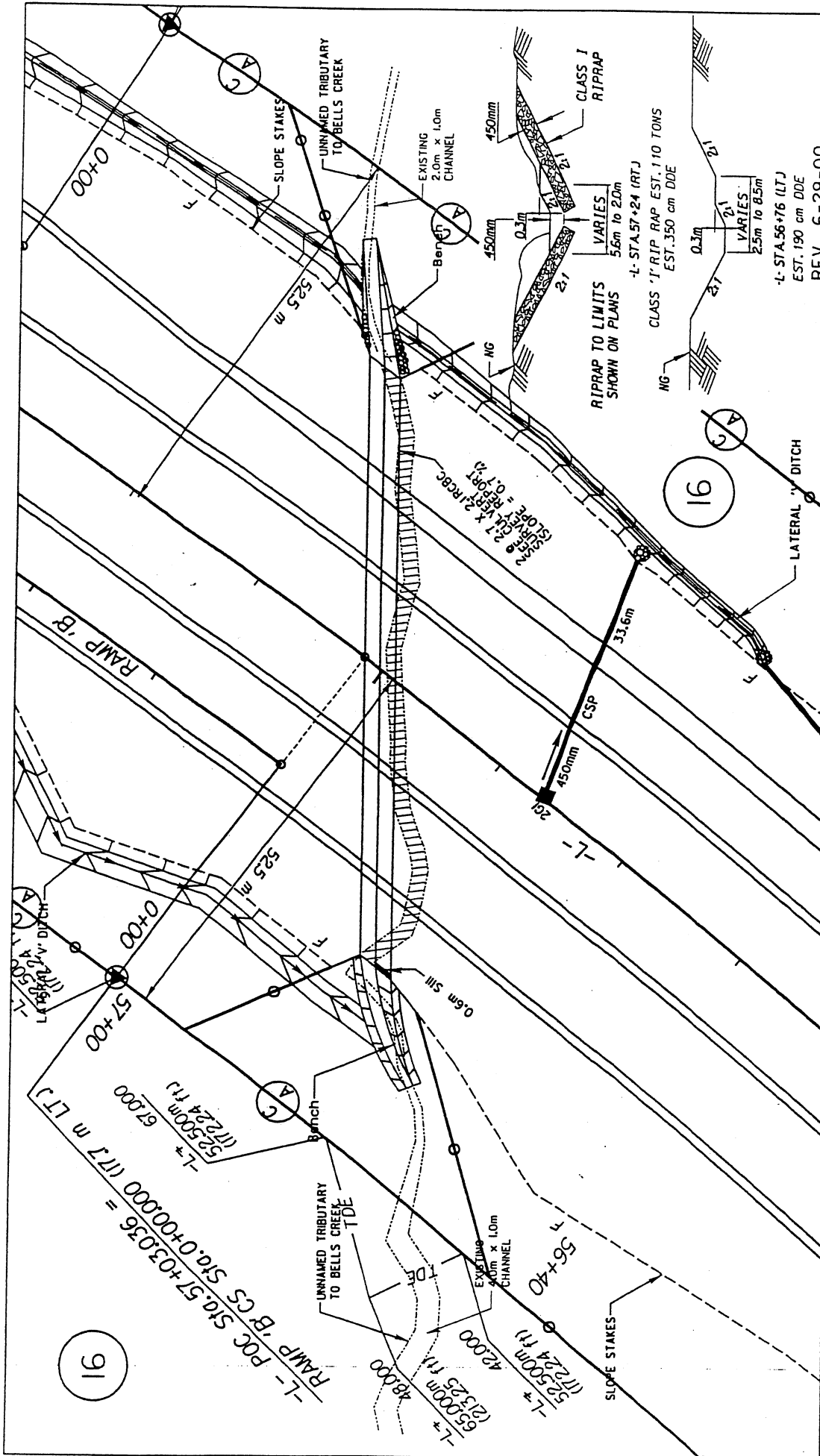
PROJECT R-2231A

PROPOSED

US 220 FROM SOUTH OF SR 148
TO SOUTH OF SR 141

REV. 9-02

SHEET 25 OF 30



PLAN VIEW - SITE IX

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

\\\\\\ DENOTES FILL SURFACE WATERS

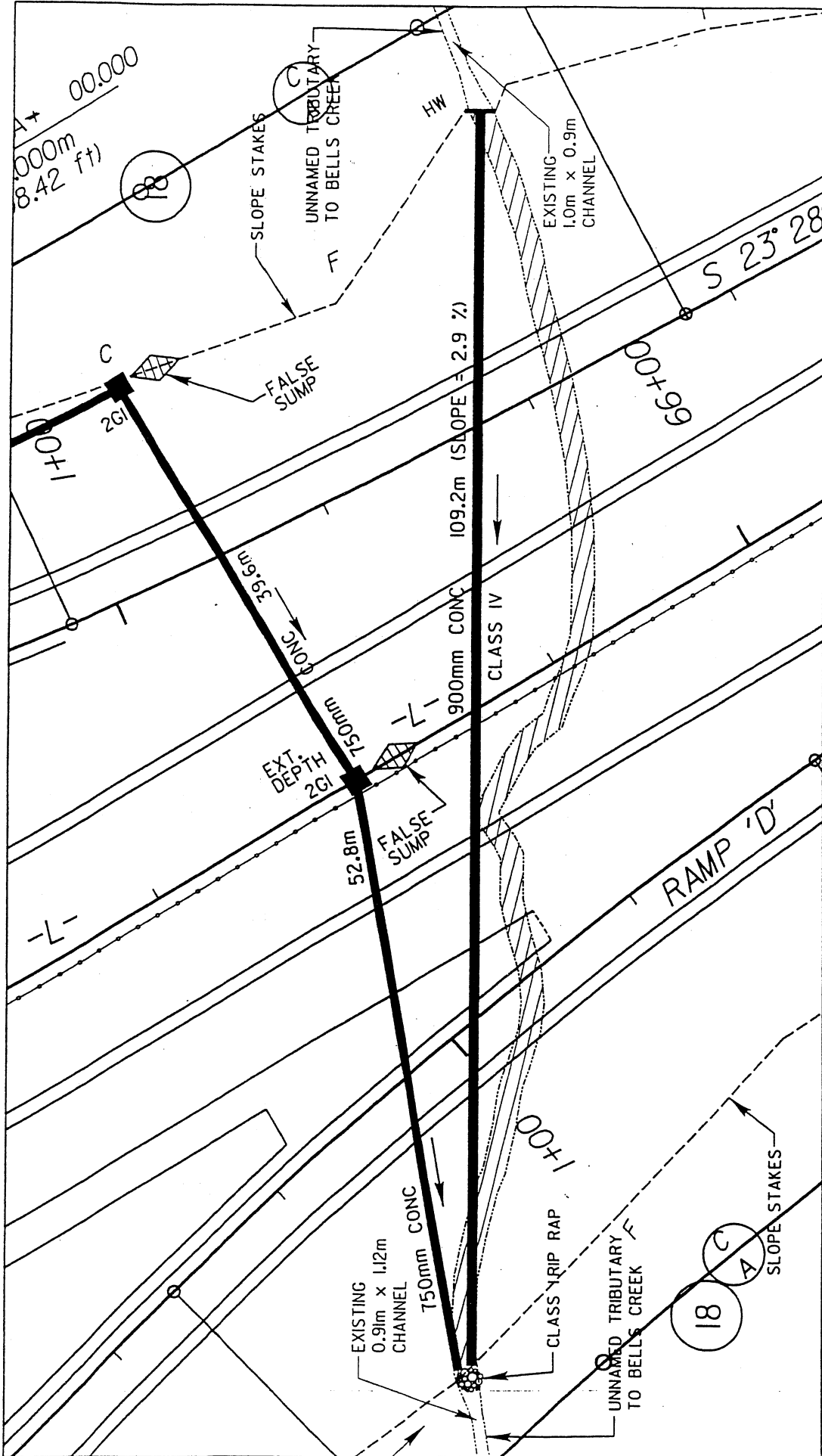
Figure 1 is a schematic diagram of a road cross-section. It shows a central road with a width of 7.5m, flanked by shoulders. The total width of the road and shoulders is 15m. The diagram is labeled with a scale of 1:750.

PROJECT R-2231A

PROPOSED

US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02



PLAN VIEW - SITE X

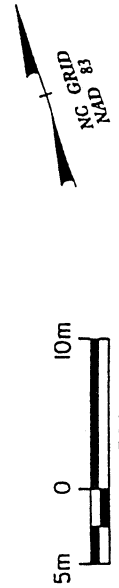
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02 SHEET 27 OF 30

\\\\\\\\\\\\\\\\\\\\ DENOTES FILL SURFACE WATERS



PARCEL NO.	PROPERTY OWNER NAME	PROPERTY OWNER ADDRESS
①	EMMA & ROLYN ELLERBE	RT 4 BOX 295 WADESBORO, N.C. 28170
②	JOSEPH G. JR. & BETTY DAVIS	915 MORNINGSIDE DR. ROCKINGHAM, N.C. 28379
③	ROBERT LEE & BRENDA KAY THORSBY	PO BOX 212 ELLERBE, N.C. 28338
④	MELVIN G ELLINGER	5341 SW 9TH PLACE CAPE CORAL, FL. 33914
⑤	DUNCAN H & CHARLOTTE Q GRANT	1836 N. US. HWY. 220 ELLERBE, N.C. 28338
⑥	NEAL HAYWOOD GRANT	1836 N. US. HWY. 220 ELLERBE, N.C. 28338
⑦	JANICE L. BROWN	PO BOX 604 ELLERBE, N.C. 28338
⑧	BOBBY ANN NICHOLSON TERRY	PO BOX 352 ELLERBE, N.C. 28338
⑨ & ⑩	JUANITA ASKEW	1230 SQUIRREL HILL RD. CHARLOTTE, N.C. 28213
⑪	HAROLD JEROME NICHOLSON	PO BOX 152 ELLERBE, N.C. 28338
⑫	WALTER RAY & EMMA STANCIL	127 STANCIL DR. ELLERBE, N.C. 28338
⑬	SANDY THOMAS LEAK	PO BOX 355 ELLERBE, N.C. 28338
⑭	ANTHONY A & BRENDA CAPEL	PO BOX 462 ELLERBE, N.C. 28338
⑯	JORDAN LUMBER & SUPPLY CO.	P.O. BOX 98 MT. GILEAD, N.C. 27306
⑰	ROGER H ALLRED SR	6726 LANCER DR. CHARLOTTE, N.C. 28226

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231A

PROPOSED
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

REV. 9-02

SHEET 28 OF 30

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Temp. Fill In SW (ha)	Existing Channel Impacted (m)	Natural Stream Design (m)
I	16+58.9 -L-		0.155			0.022					
IIA	19+00 -L-		0.924								
IIB	21+08.7 -L-		0.528		0.004	0.038	0.038			192.16	
IIC	22+80 -L-				0.065	0.004					
III	27+00 -L-		0.225		0.658	0.051	0.015			61.92	
IV	30+44.5 -L-		0.608			0.064	0.019			97.52	
V	34+58.9 -L-		0.173			0.02					
VI	38+56.2 -L-		0.717			0.067					
VII	46+75 -L-		0.469			0.05	0.018			71.2	
VIII	52+31.4 -L-		0.103			0.011	0.016			93.88	
IX	57+00 -L-	2 @ 2.7m x 2.1m RCBC					0.016			80.84	
X	65+72 -L-						0.023			114.08	
TOTALS:			3.902	0	0.727	0.327	0.145	0	0	711.60	0

NCDOT

DIVISION OF HIGHWAYS
 RICHMOND COUNTY
 PROJECT: R-2231A
 US 220 BYPASS SOUTH OF SR 1448
 TO SOUTH OF SR 1441

10/16/02

SHEET 29 OF 30

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
I	16+58.9 -L-		0.38			0.05					
IIA	19+00 -L-		2.28								
IIB	21+08.7 -L-		1.30		0.01	0.09	0.09			630.4	
IIC	22+80 -L-				0.16	0.01					
III	27+00 -L-		0.56		1.63	0.13	0.04			203.1	
IV	30+44.5 -L-		1.50			0.16	0.05			319.9	
V	34+58.9 -L-		0.43			0.05					
VI	38+56.2 -L-		1.77			0.17					
VII	46+75 -L-		1.16			0.12	0.04			233.5	
VIII	52+31.4 -L-		0.25			0.03	0.04			308.0	
IX	57+00 -L-	2 @ 9' x 8' RCBC					0.04			265.2	
X	65+72 -L-						0.06			374.3	
TOTALS:			9.63	0	1.80	0.81	0.36	0	0	2334.4	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

RICHMOND COUNTY
PROJECT: R-2231A
US 220 BYPASS

10/16/02
SHEET 30 OF 30

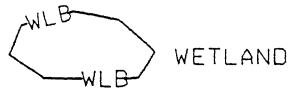
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

WETLAND LEGEND

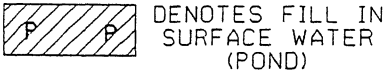
—WLB— WETLAND BOUNDARY



DENOTES FILL IN WETLAND



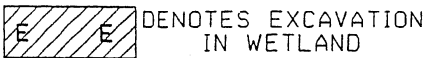
DENOTES FILL IN SURFACE WATER



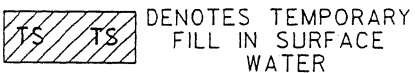
DENOTES FILL IN SURFACE WATER (POND)



DENOTES TEMPORARY FILL IN WETLAND



DENOTES EXCAVATION IN WETLAND



DENOTES TEMPORARY FILL IN SURFACE WATER



DENOTES MECHANIZED CLEARING

— — — FLOW DIRECTION

—TB— TOP OF BANK

---WE--- EDGE OF WATER

---C--- PROP. LIMIT OF CUT

---F--- PROP. LIMIT OF FILL

—▲— PROP. RIGHT OF WAY

—NG— NATURAL GROUND

---PL--- PROPERTY LINE

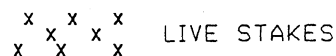
—TDE— TEMP. DRAINAGE EASEMENT

—PDE— PERMANENT DRAINAGE EASEMENT

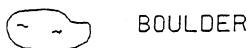
—EAB— EXIST. ENDANGERED ANIMAL BOUNDARY

—EPB— EXIST. ENDANGERED PLANT BOUNDARY

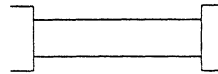
---▽--- WATER SURFACE



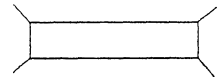
LIVE STAKES



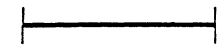
— — — CORE FIBER ROLLS



PROPOSED BRIDGE



PROPOSED BOX CULVERT



PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTING STRUCTURES)

12"-48"

PIPES

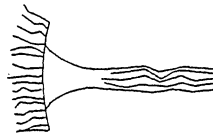
54" PIPES & ABOVE



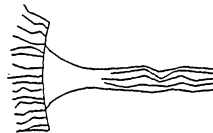
SINGLE TREE



WOODS LINE



DRAINAGE INLET



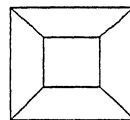
ROOTWAD



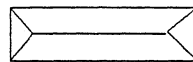
RIP RAP



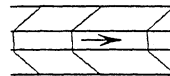
ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE



PREFORMED SCOUR HOLE (PSH)



LEVEL SPREADER (LS)

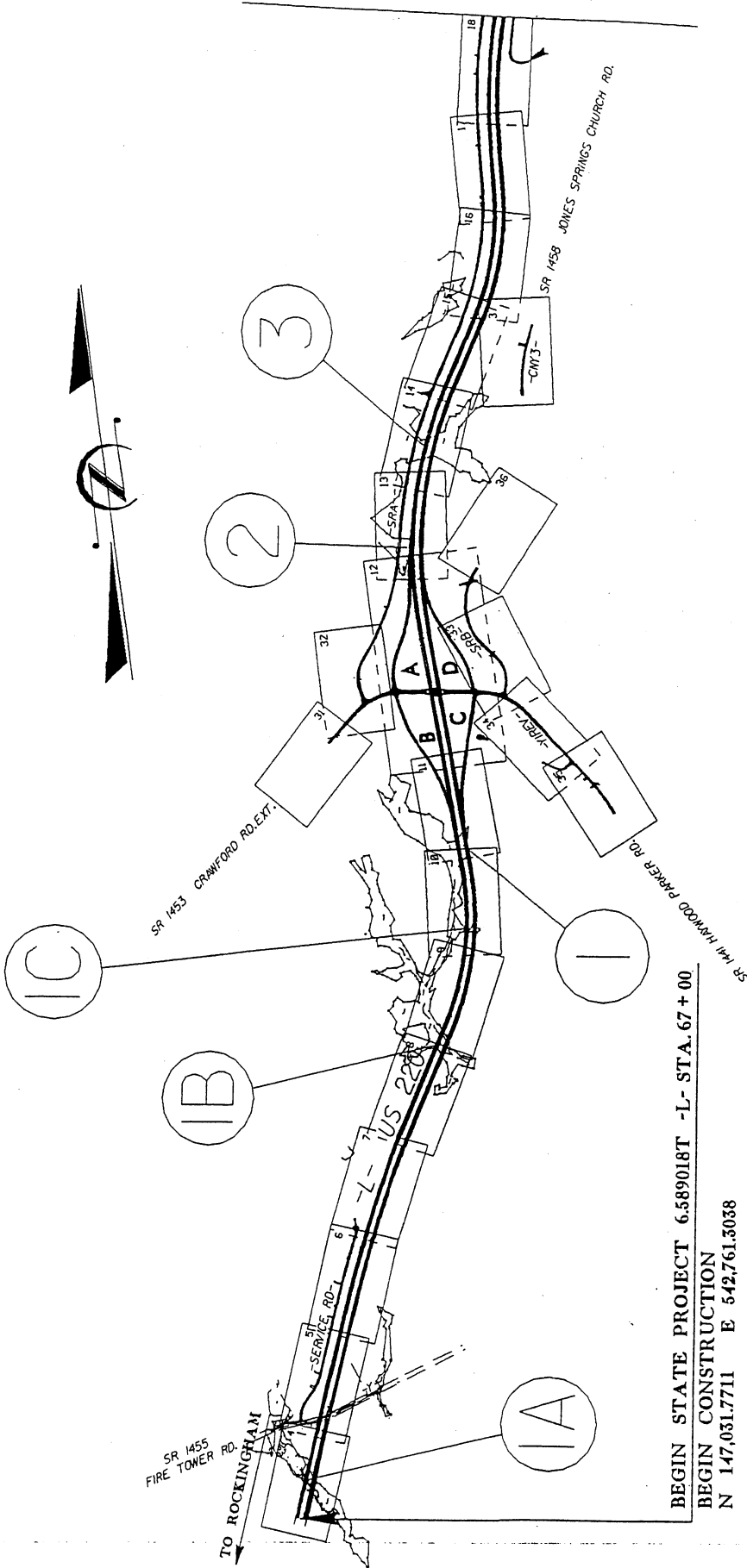


GRASS SWALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

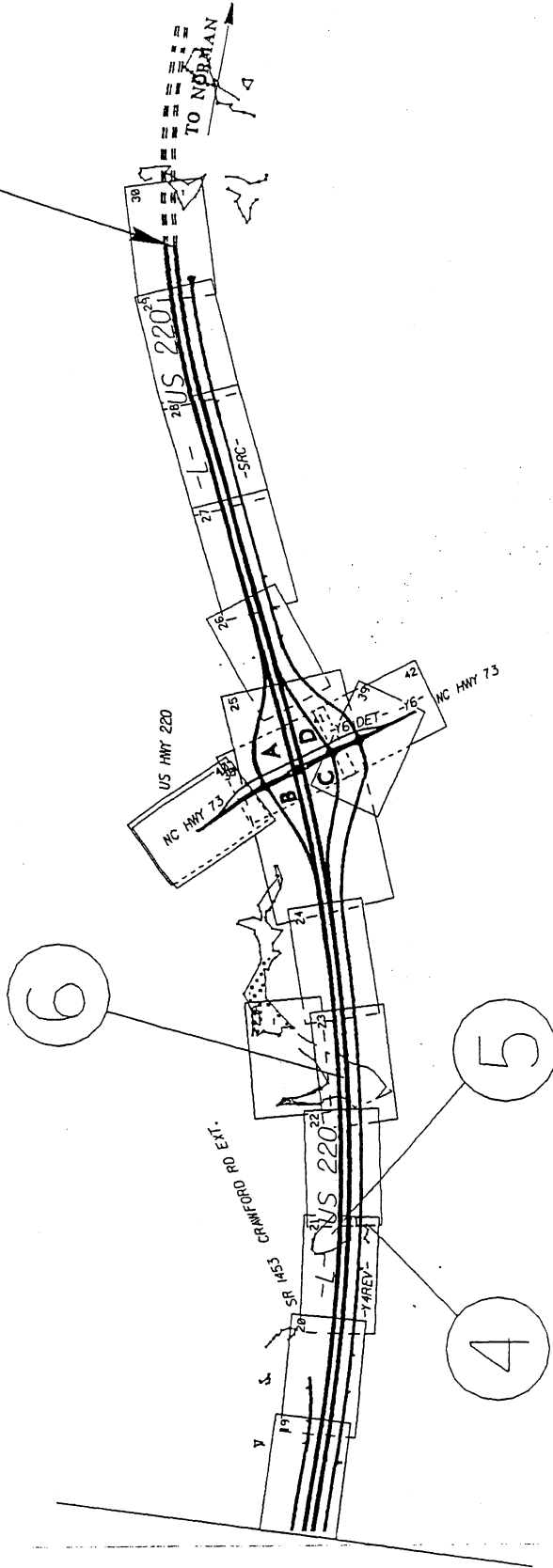
SHEET 3 OF 43

9/02

VICINITY MAP



END STATE PROJECT 6.589018T -L- STA. 170 + 80
N 157,070.5049 E 544,367.5720

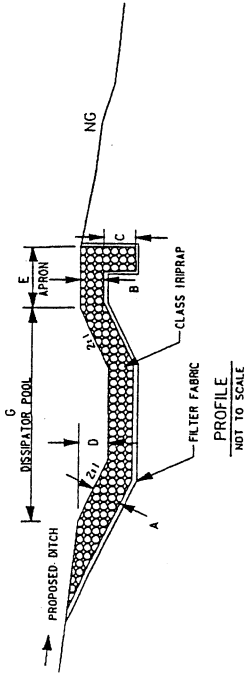


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)
US 220 BYPASS

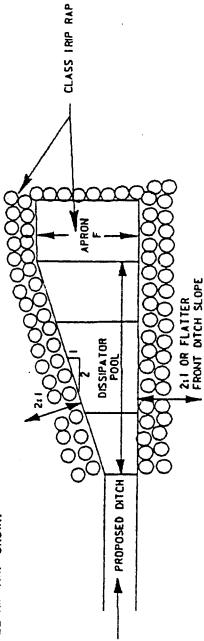
VICINITY MAP

DETAIL OF RIP-RAPPED DITCH ENERGY DISSIPATOR BASIN

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RALEIGH, N.C.



NOT ALL RIP RAP SHOWN



DIM. (m)	RIP RAP BASIN #					
	1	2	3	4	5	6
A	0.60	0.60	0.60	0.60	0.60	0.60
B	0.60	0.60	0.60	0.60	0.60	0.60
C	0.60	0.60	0.60	0.60	0.60	0.60
D	0.60	0.60	0.60	0.60	0.60	0.60
E	3.0	3.0	3.0	3.0	3.0	3.0
F	6.0	6.0	6.0	6.0	6.0	6.0
G	12.0	12.0	12.0	12.0	12.0	12.0

ALL DIMENSIONS APPROXIMATE

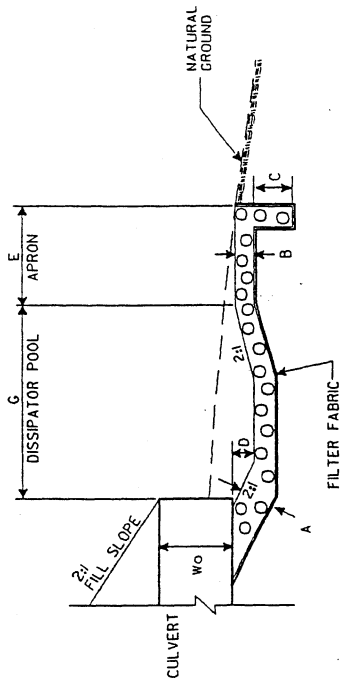
BASIN #	LOCATION
1	Sta 67+54 To 67+71 -L- (R+)
2	Sta 68+28 To 68+45 -L- (L+)
3	Sta 68+41 To 68+69 -L- (R+)
4	Sta 85+16 To 85+31 -L- (L+)
5	Sta 86+35 To 86+50 -L- (L+)
6	Sta 28+20 To 28+37 -L- (R+)

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DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)

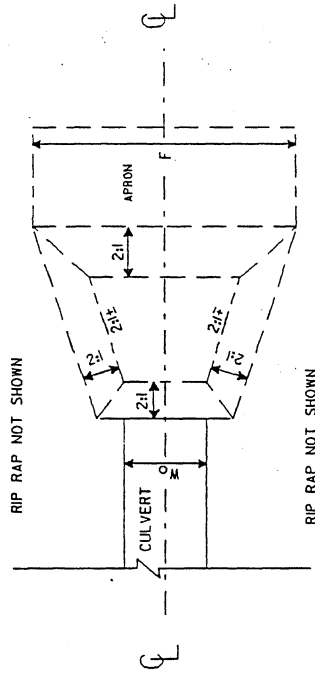
US 220 BYPASS

9/02

Q SECTION



HALF PLAN



DIM. (m)	RIP RAP BASIN #		
	1	2	3
A	0.60	0.60	0.60
B	0.60	0.60	0.60
C	0.60	0.60	0.60
D	0.60	0.60	0.60
E	3.0	3.0	3.0
F	8.4	8.4	8.4
G	6.0	6.0	6.0

ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	Sta 90+80 -L- (Lt)
2	Sta 93+80 -L- (Lt)
3	Sta 108+04 -L- (Rt)

DETAIL OF RIP-RAPPED OUTLET ENERGY DISSIPATOR BASIN

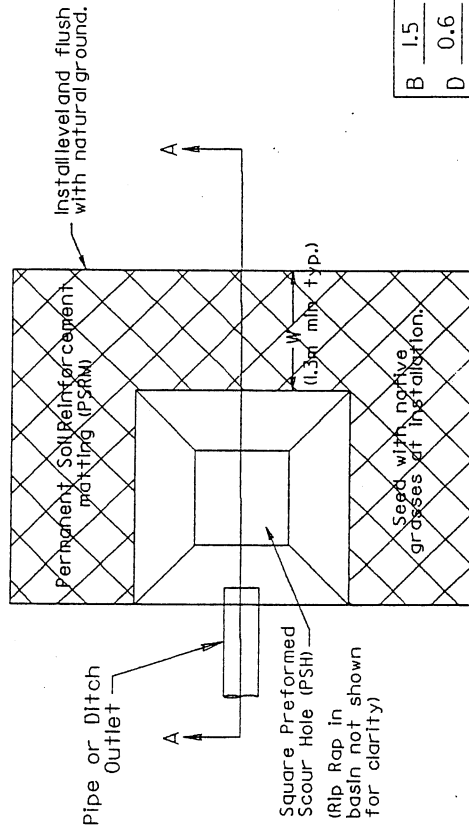
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RALEIGH, N.C.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)

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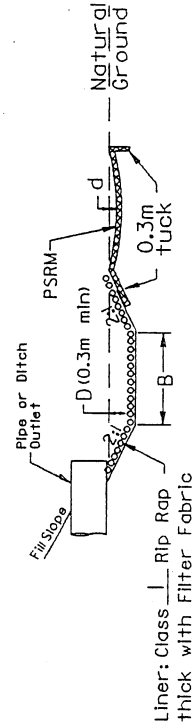
PREFORMED SCOUR HOLE

PLAN VIEW



B	1.5
D	0.6
W	2.0
d	0.15

SECTION A-A



BASIN #	LOCATION (AT OUTLET)
1	Sta 69+34 -L- (Rt)
2	Sta 85+00 -L- (Rt)
3	Sta 85+73 -L- (Rt)
4	Sta 15+81 -SRA- (Lt)
5	Sta 16+67 -SRA- (Lt)
6	Sta 22+78 -Y4REV- (Rt)
7	Sta 141+00 -L- (Lt)

N. C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

RICHMOND COUNTY

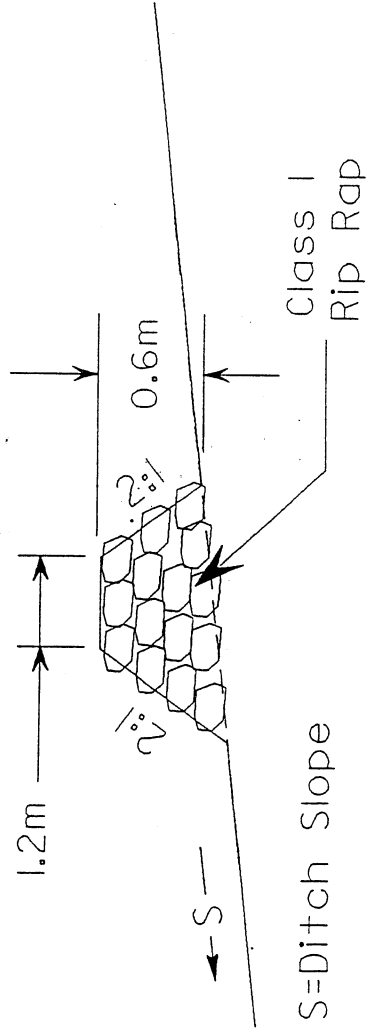
PROJECT: 8.T550802 (R-2231B)

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SHEET 7 OF 43

PERMANENT BERM
(Not to Scale)



N. C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

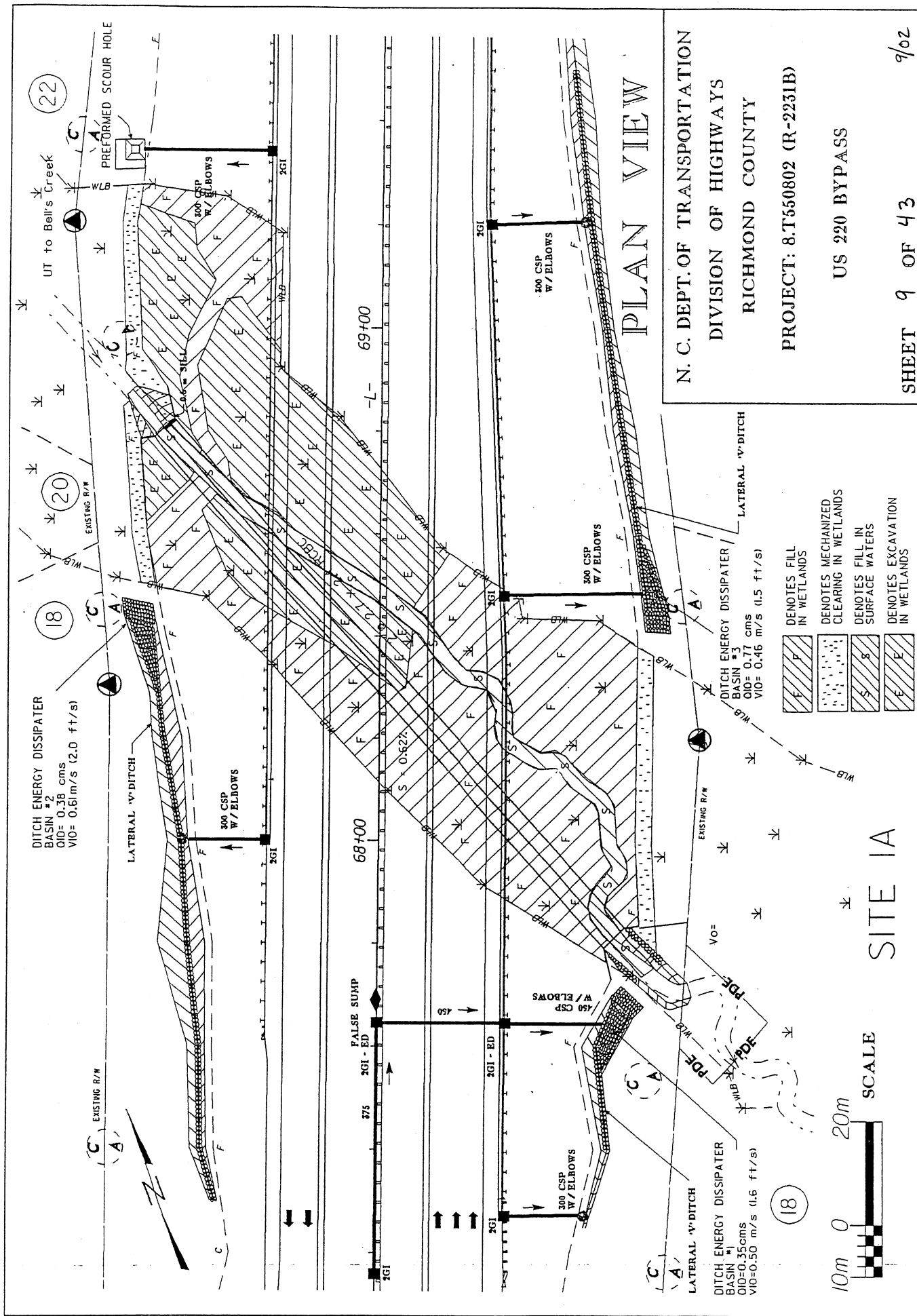
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

7/02

SHEET 8 OF 43



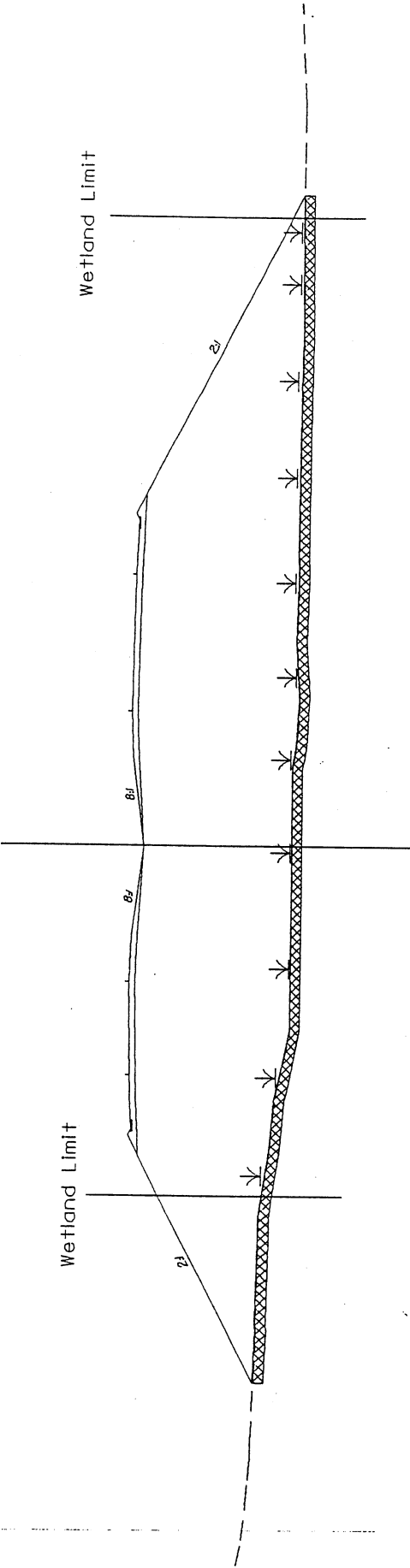
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DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

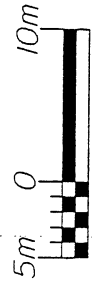
SHEET 9 OF 43 9/02

10m 0 20m SCALE
SITE 1A

Typical Section
68+40 -L-



SECTION

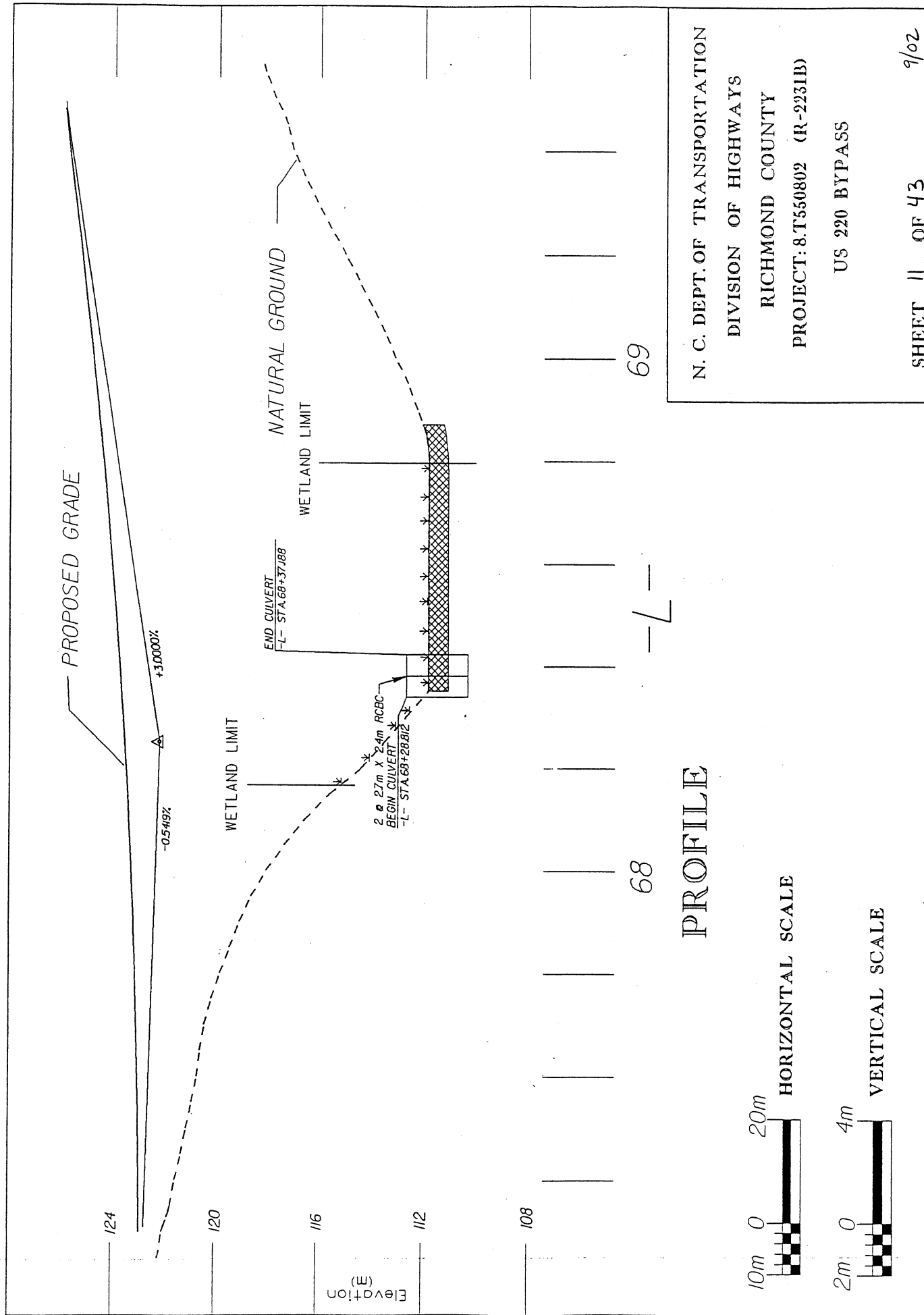


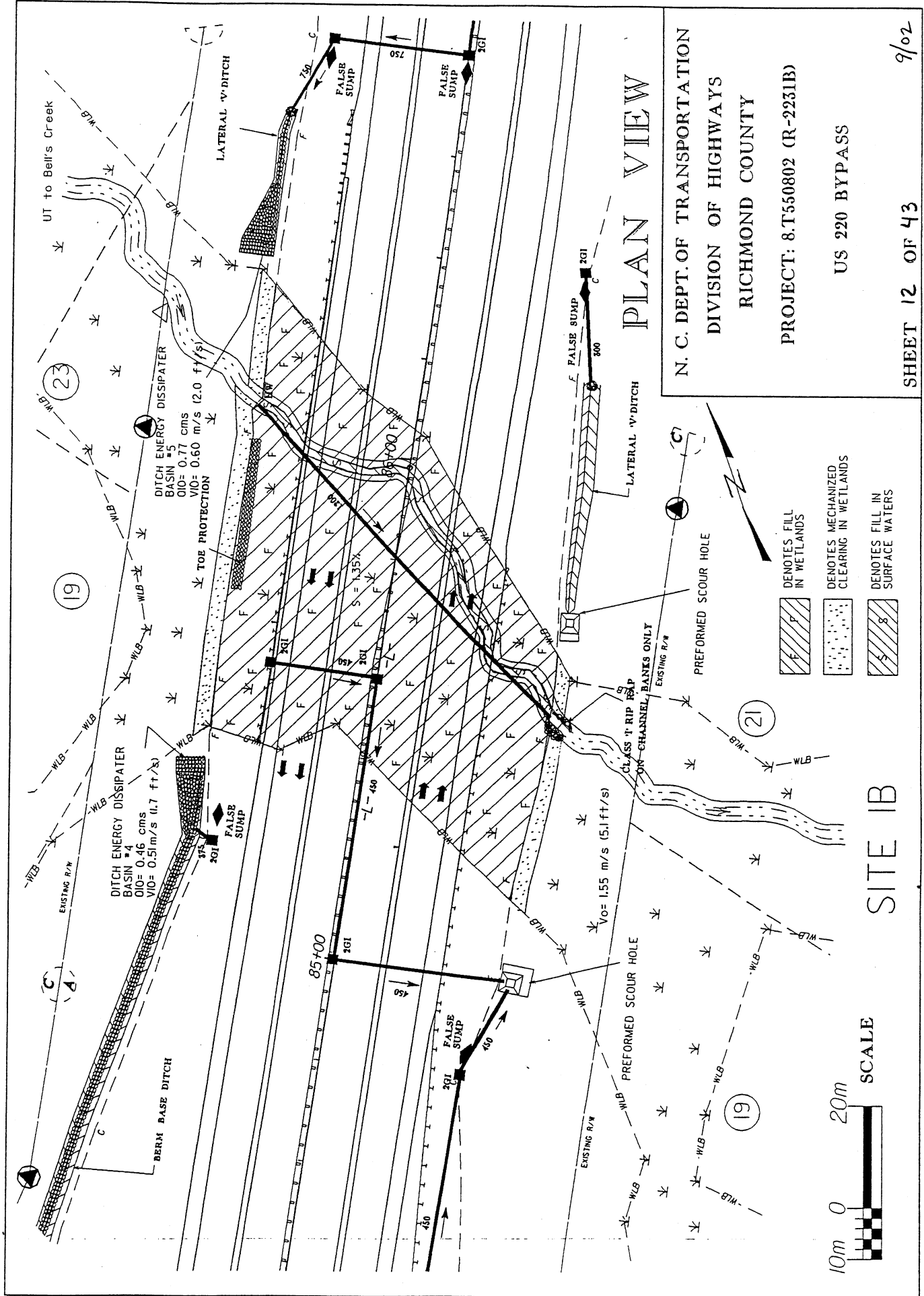
HORIZONTAL SCALE



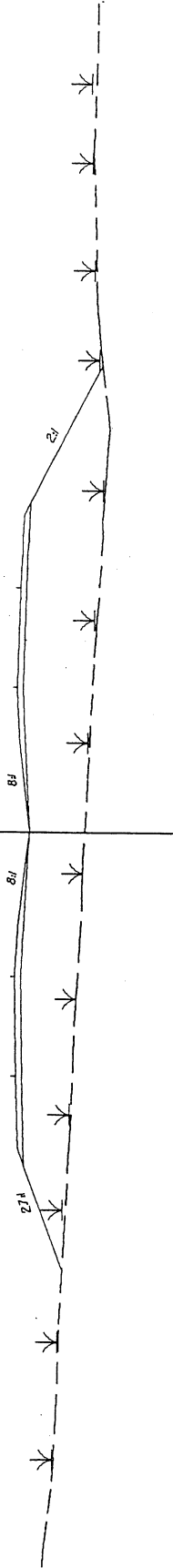
VERTICAL SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)
US 220 BYPASS





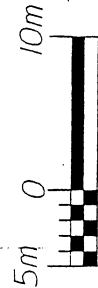
Typical Section
85+60 -L-



SECTION



HORIZONTAL SCALE

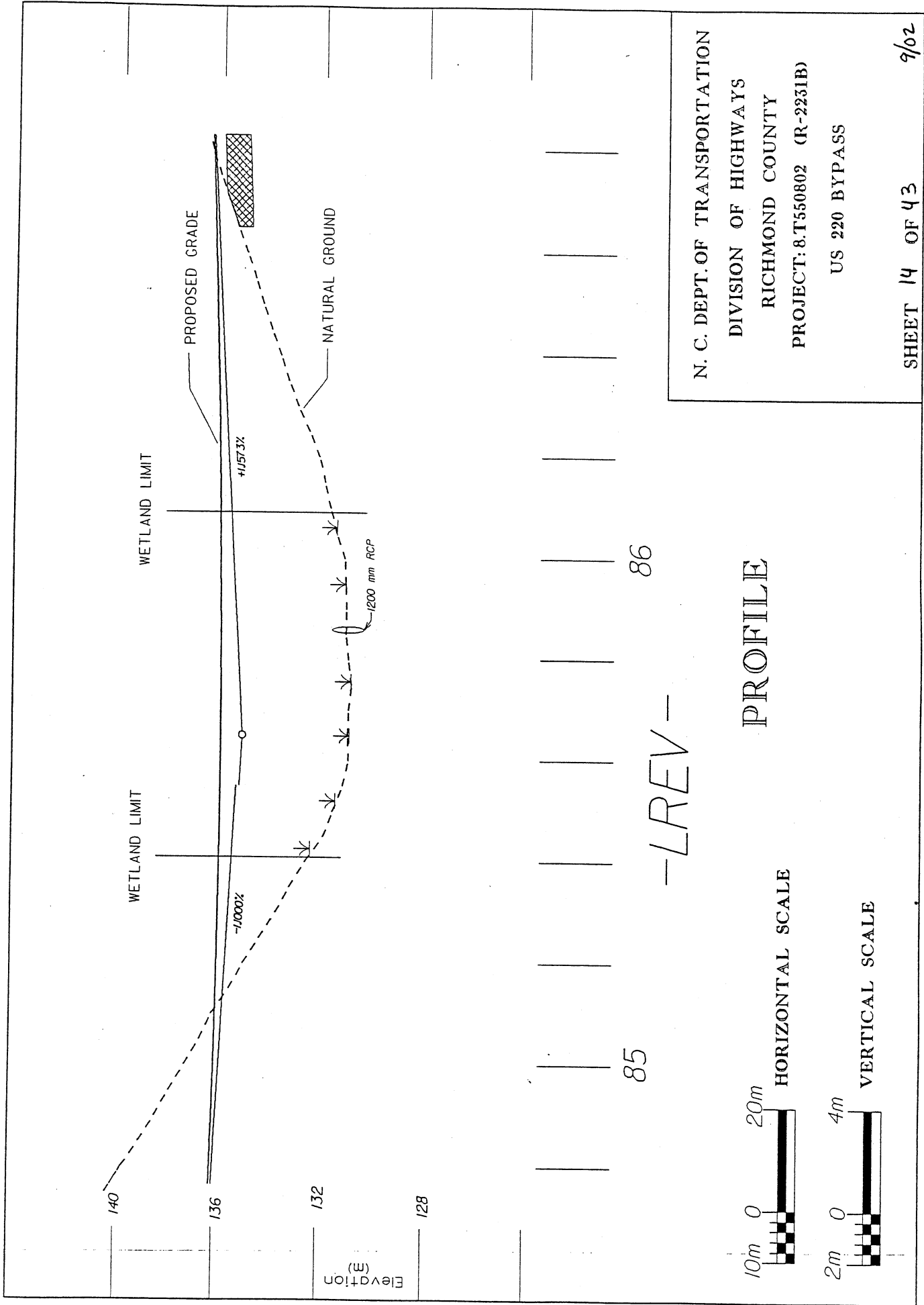


VERTICAL SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)
US 220 BYPASS

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9/02



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

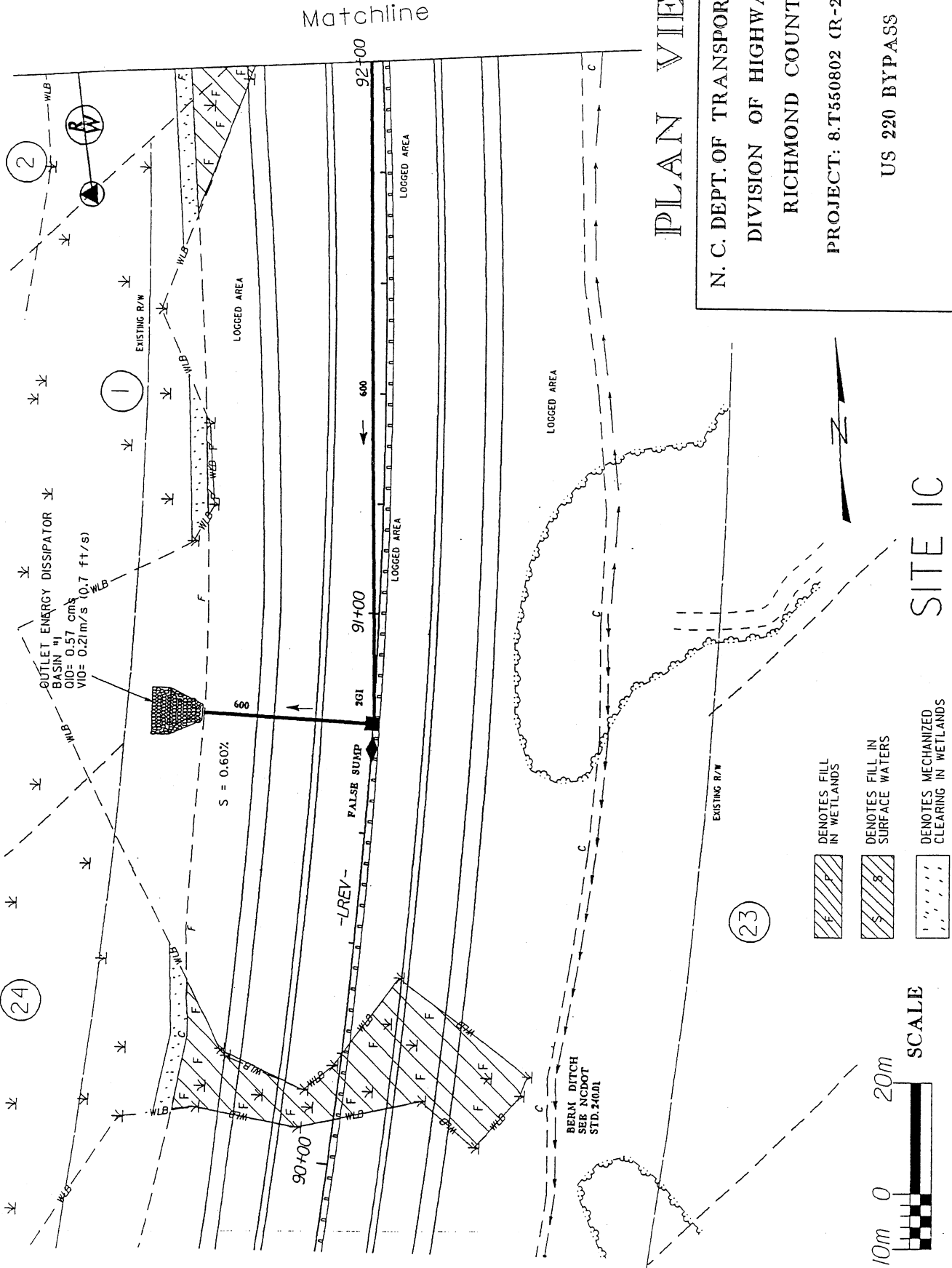
SHEET 14 OF 43 9/02

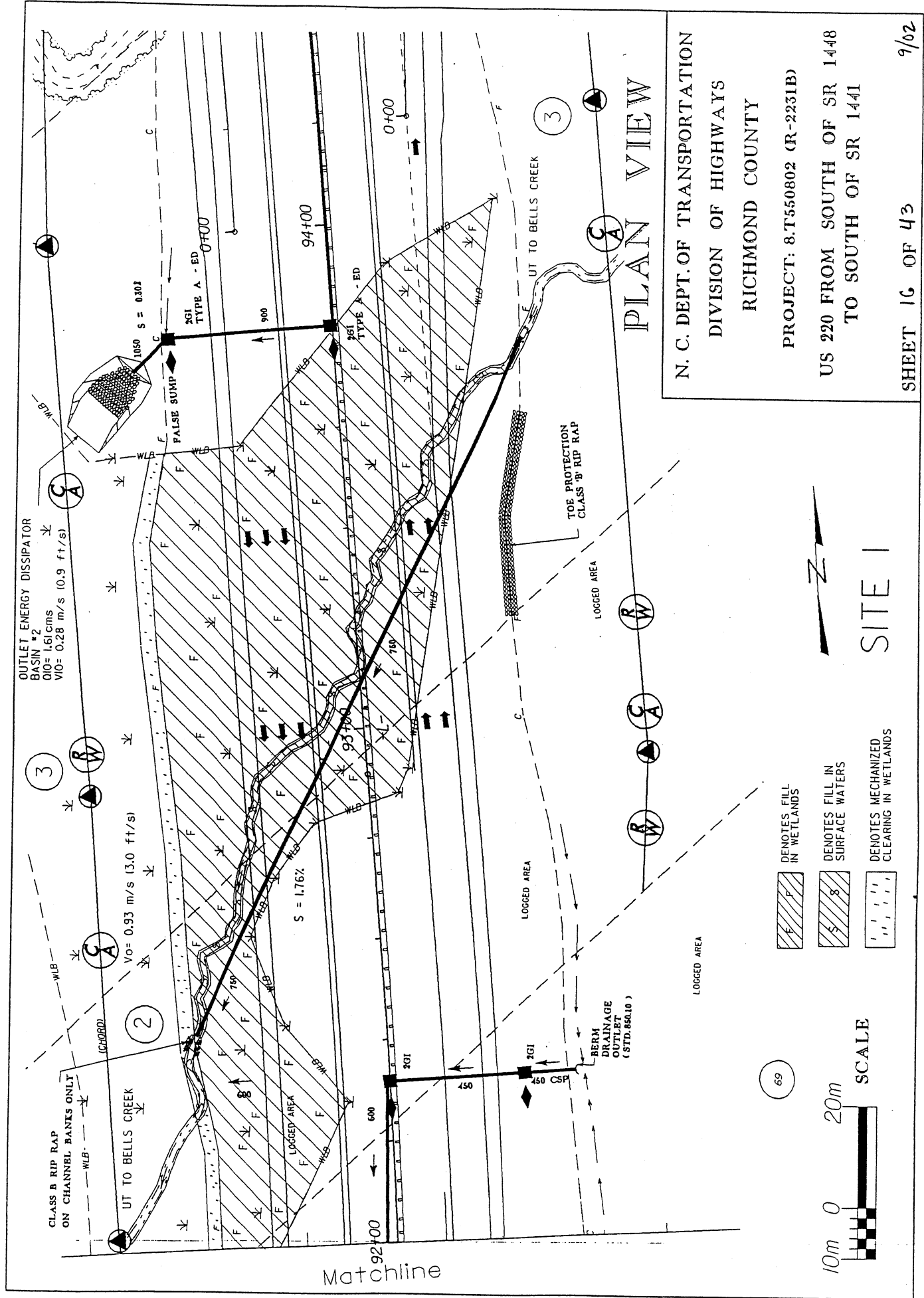
PLAN VIEW

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)

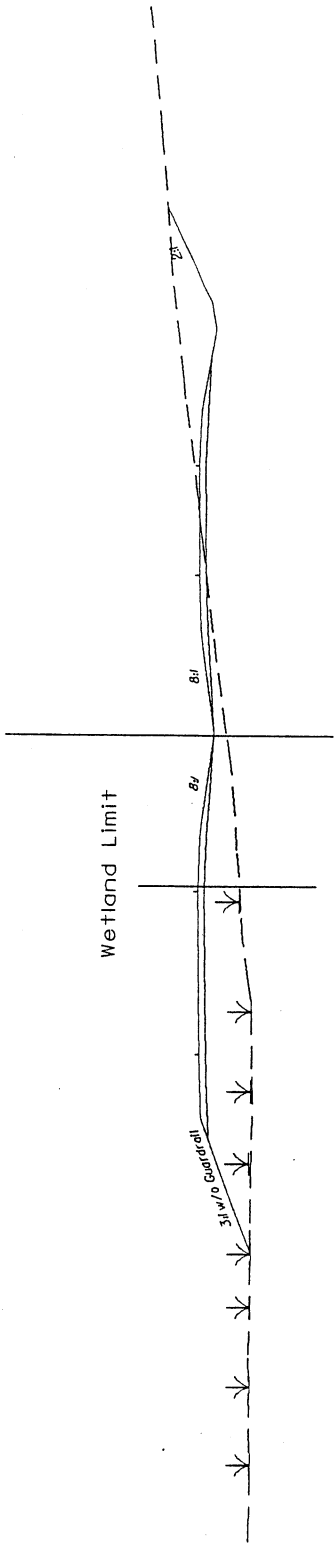
US 220 BYPASS

SHEET 15 OF 43 9/02

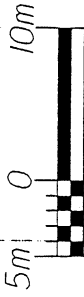




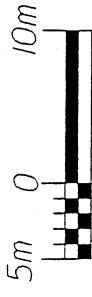
Typical Section
92+80 -L-



SECTION



HORIZONTAL SCALE



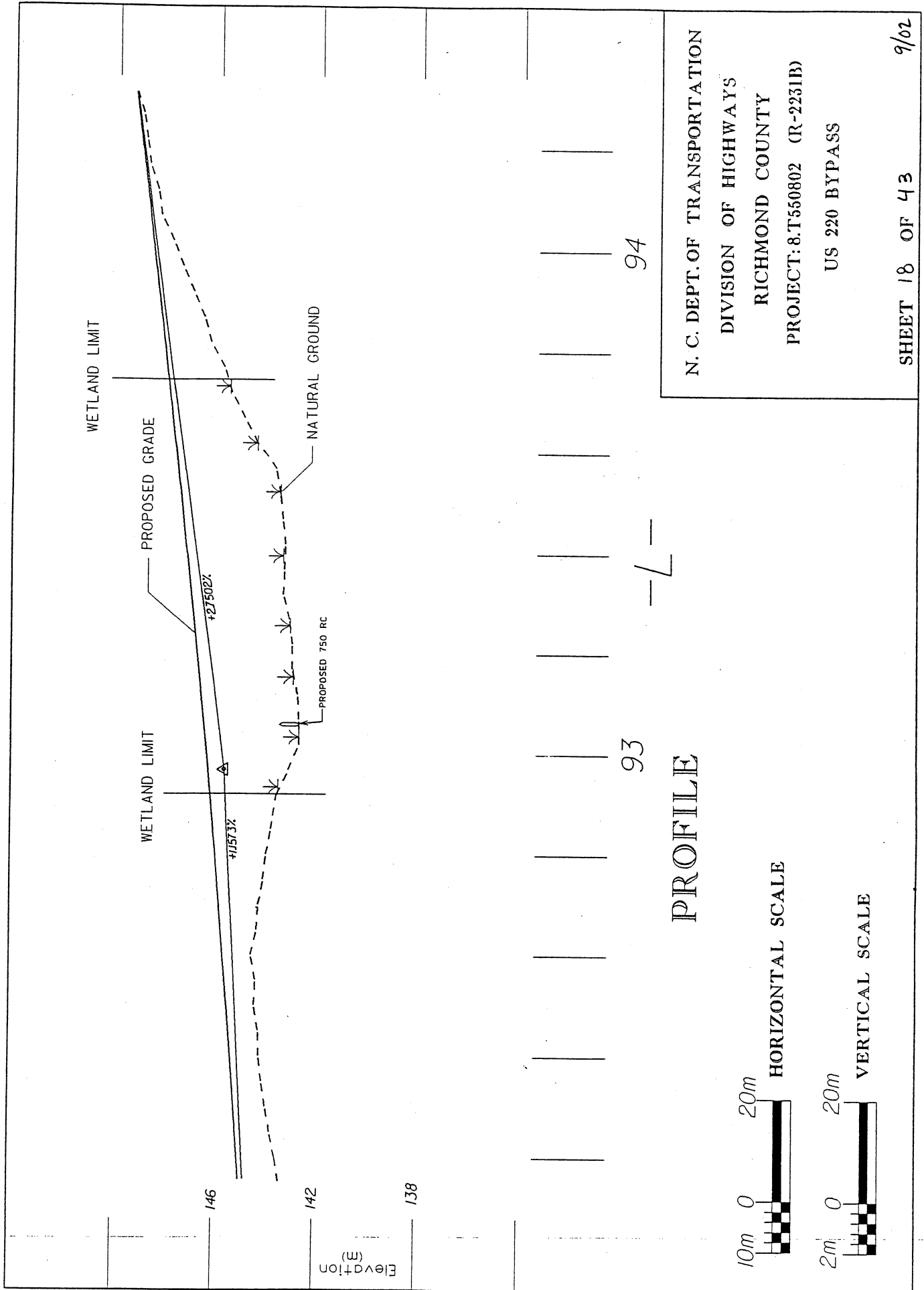
VERTICAL SCALE

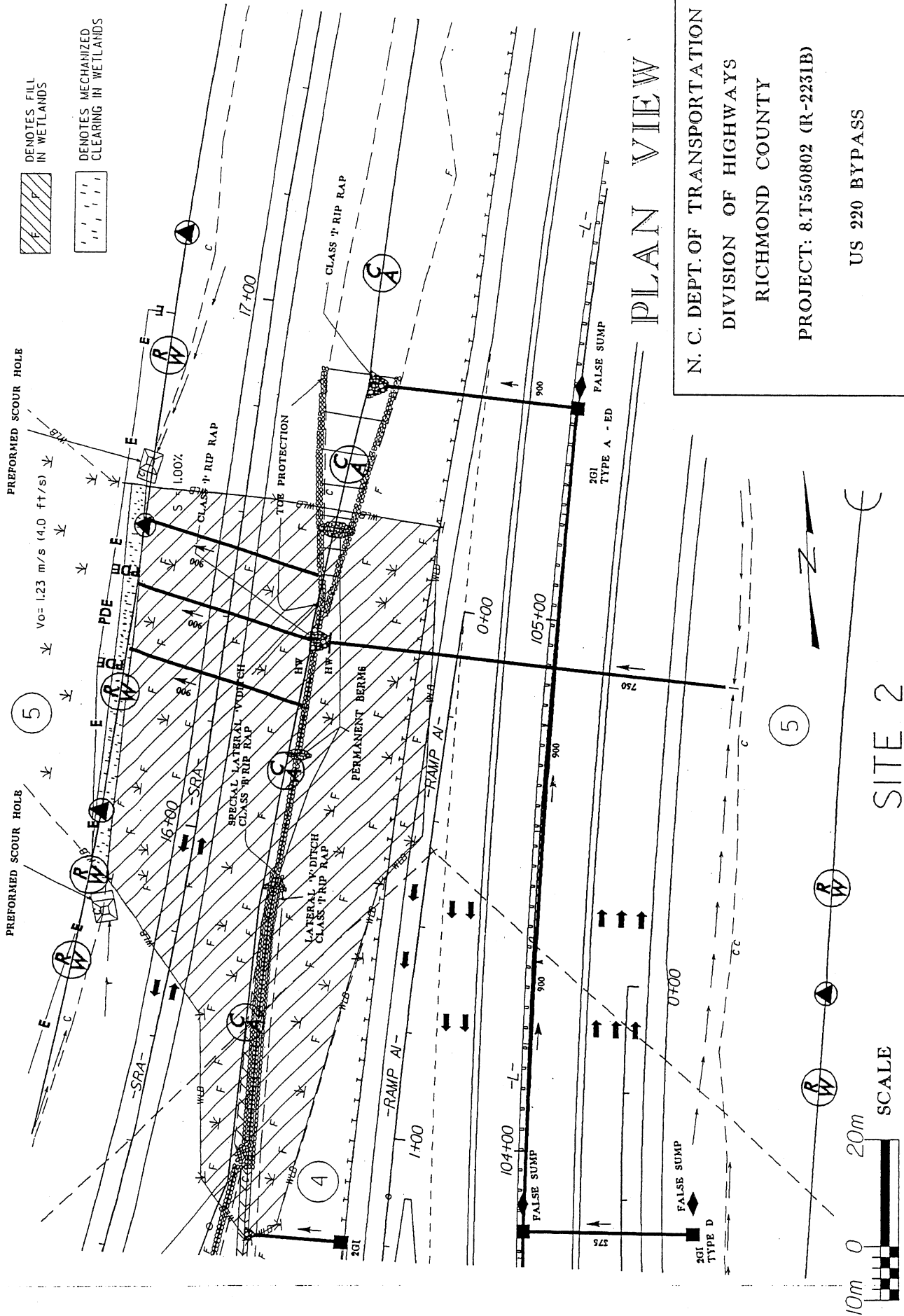
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550803 (R-2231B)

US 220 BYPASS

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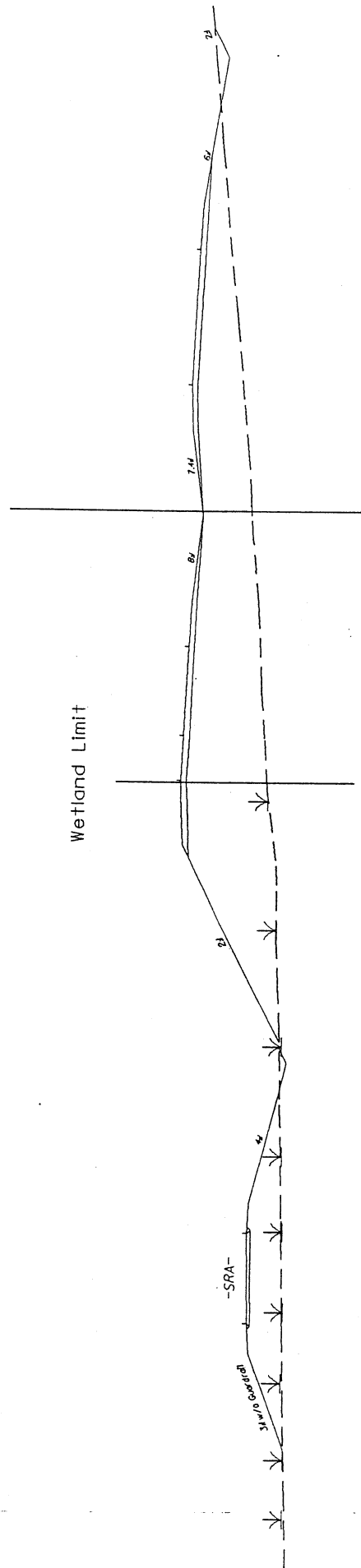
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

SHEET 19 OF 43

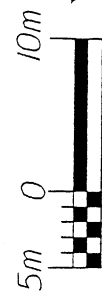
9/02



SECTION



HORIZONTAL SCALE



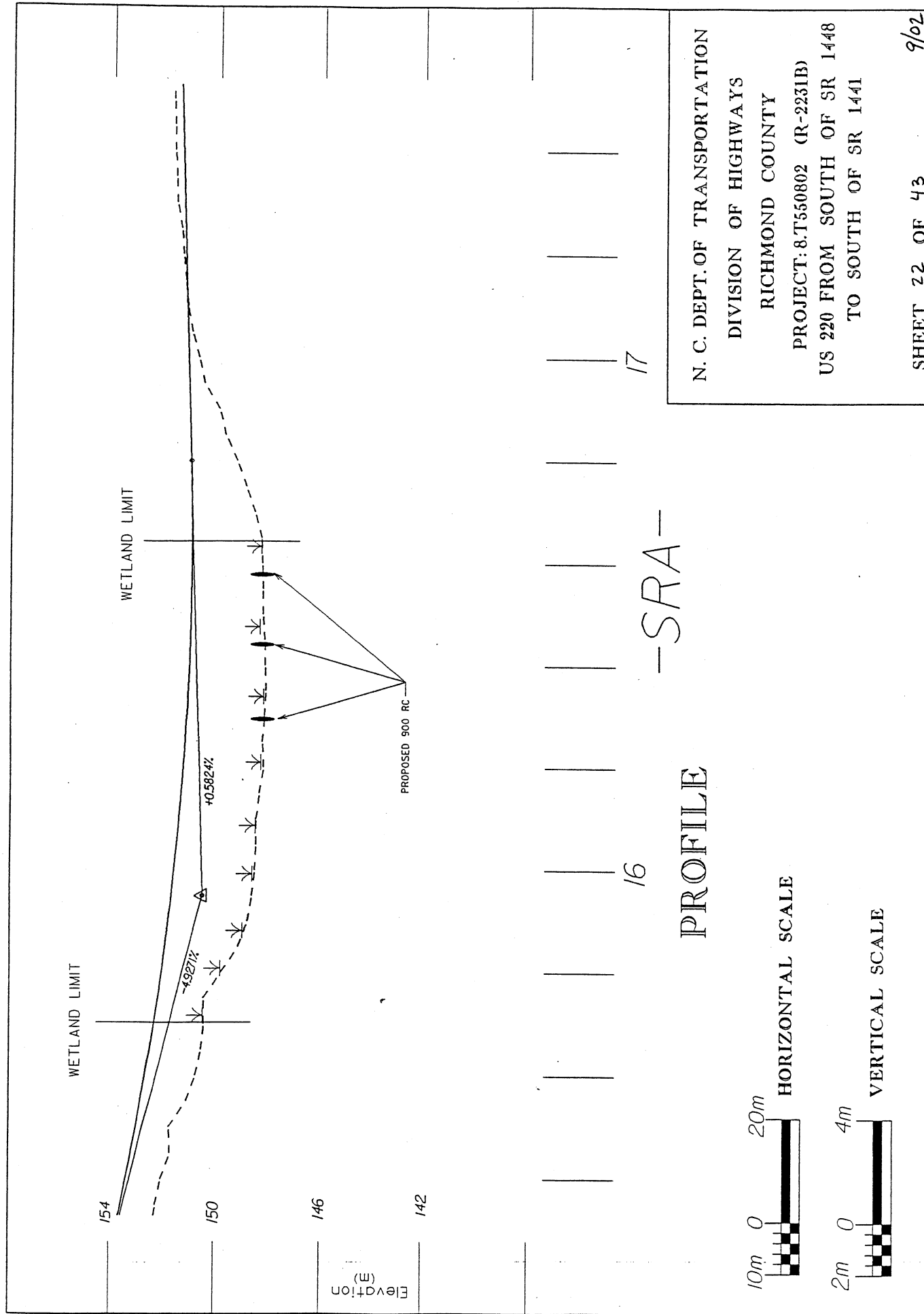
VERTICAL SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550803 (R-2231B)

US 220 BYPASS

SHEET 21 OF 43

9/02



PROFILE



HORIZONTAL SCALE



VERTICAL SCALE

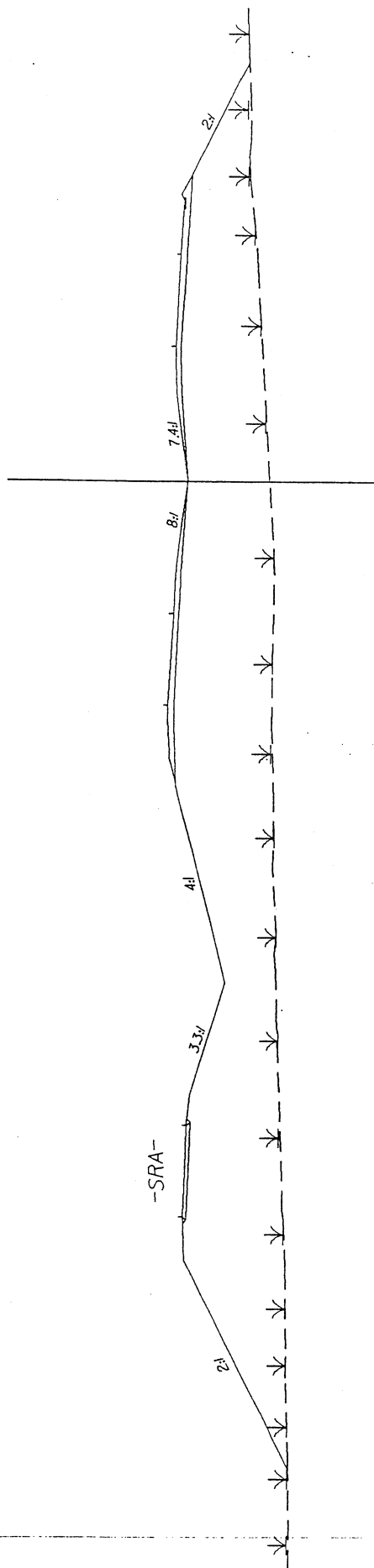
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)
US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

SHEET 22 OF 43

9/02



Typical Section 108+40 -L-



SECTION



N. C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

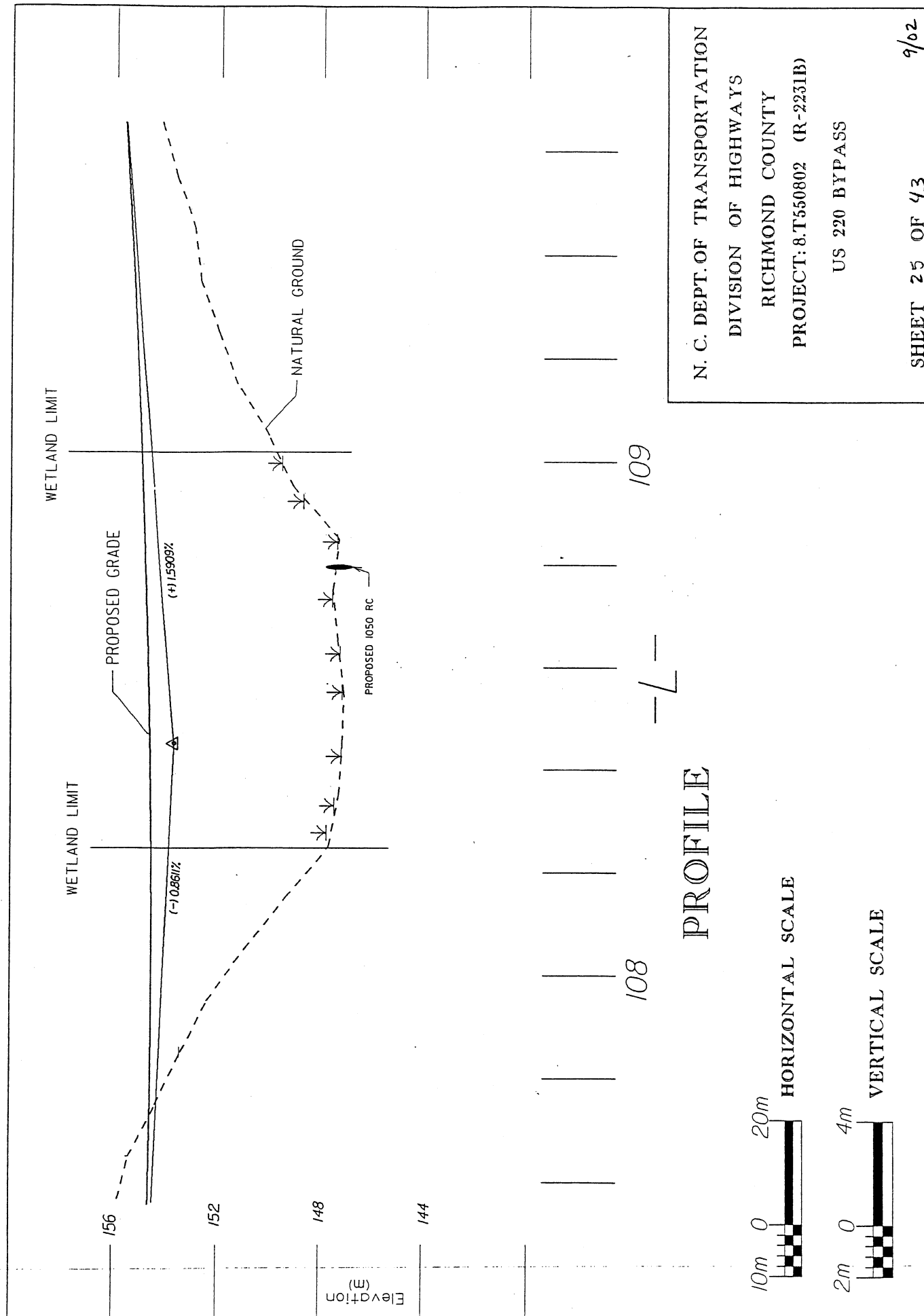
RICHMOND COUNTY

PROJECT: 8.T550803 (R-2231B)

US 220 BYPASS

SHEET 24 OF 43

9/02



N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RICHMOND COUNTY
 PROJECT: 8.T550802 (R-2231B)
 US 220 BYPASS

PLAN VIEW

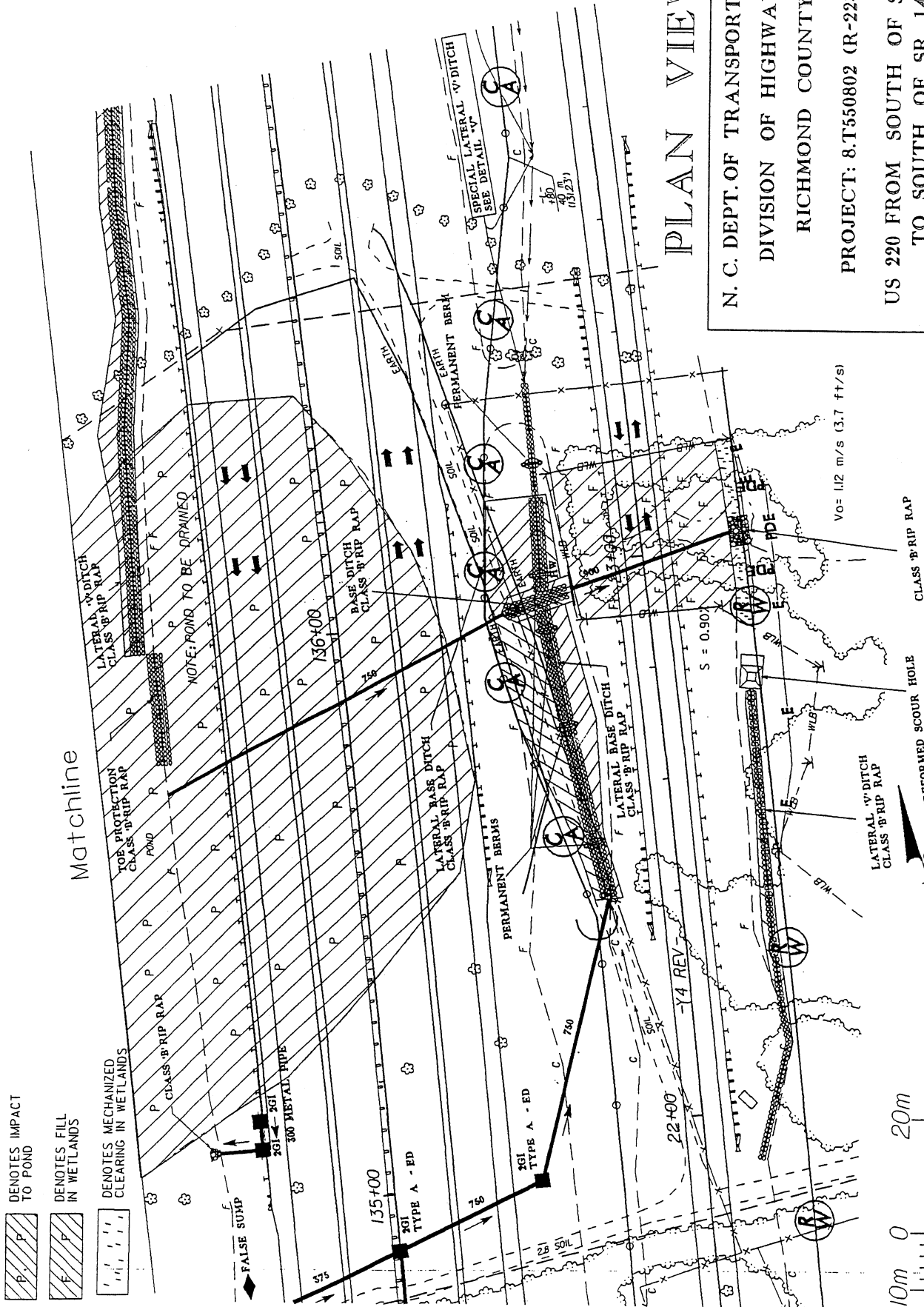
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

SHEET 26 OF 43

9/02



PLAN VIEW

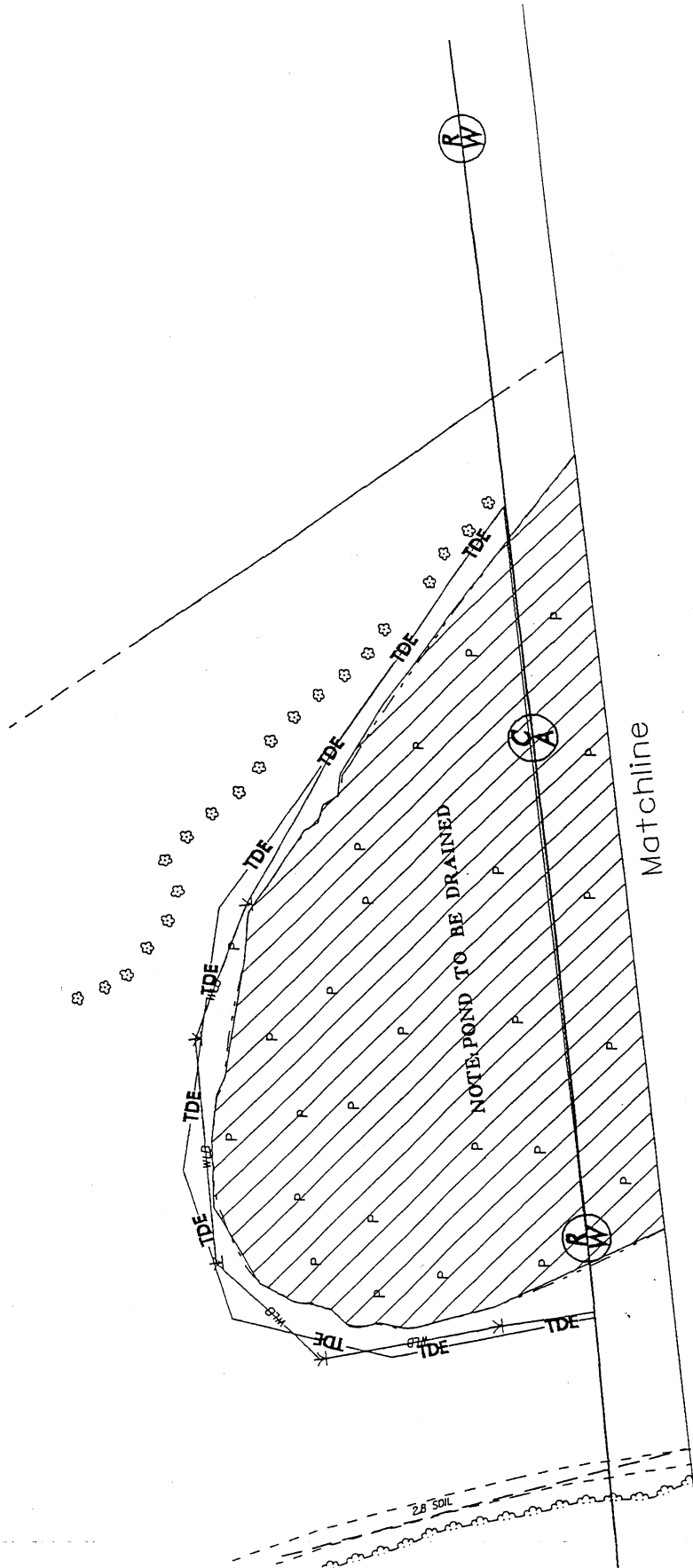
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 FROM SOUTH OF SR 1448
TO SOUTH OF SR 1441

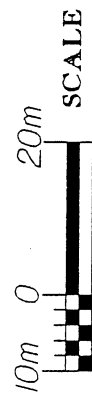
SHEET 21 OF 43

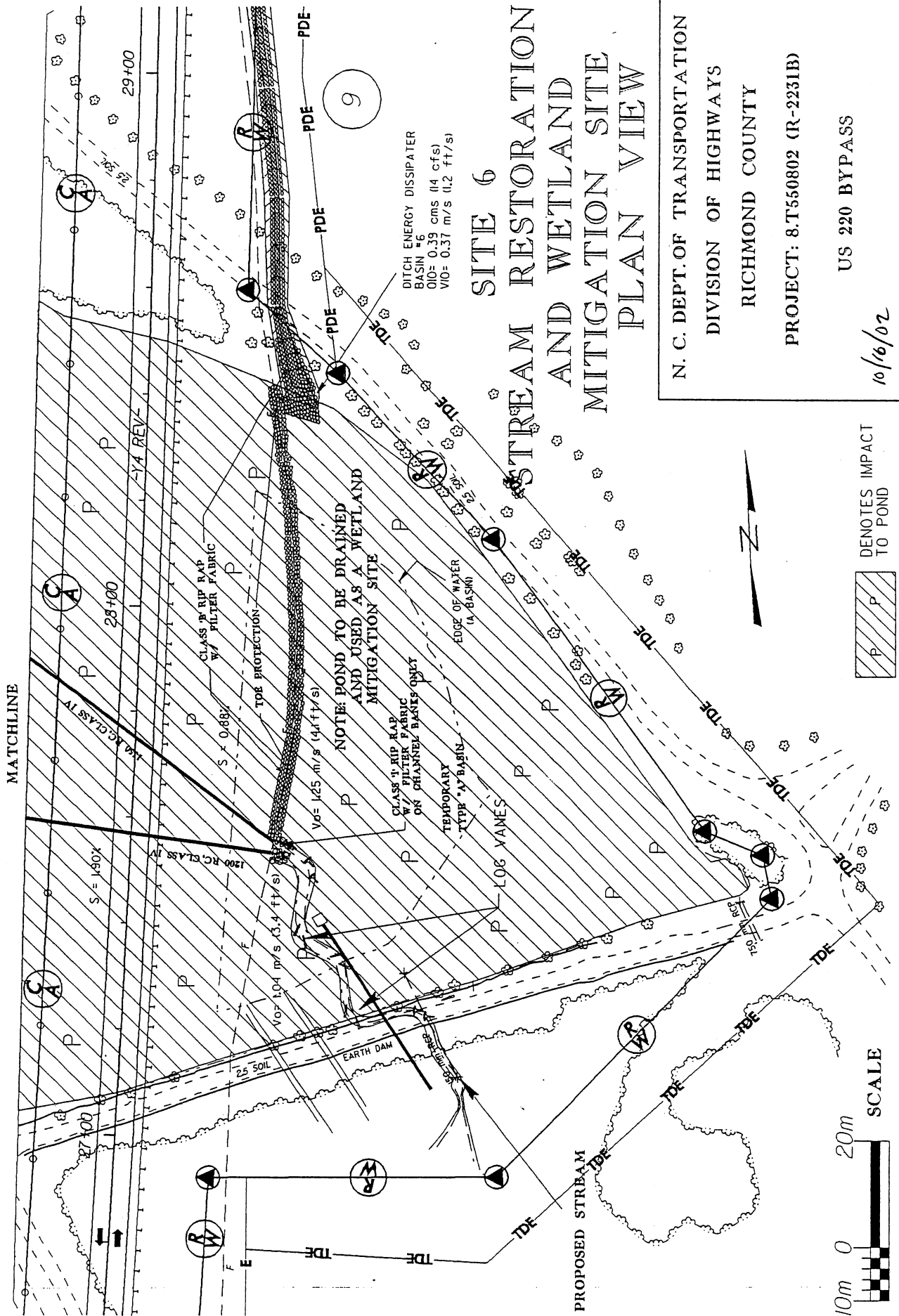
9/02



SITE 5

Hatched area
DENOTES IMPACT
TO POND





SITE 6 STREAM RESTORATION AND WETLAND MITIGATION SITE PLAN VIEW

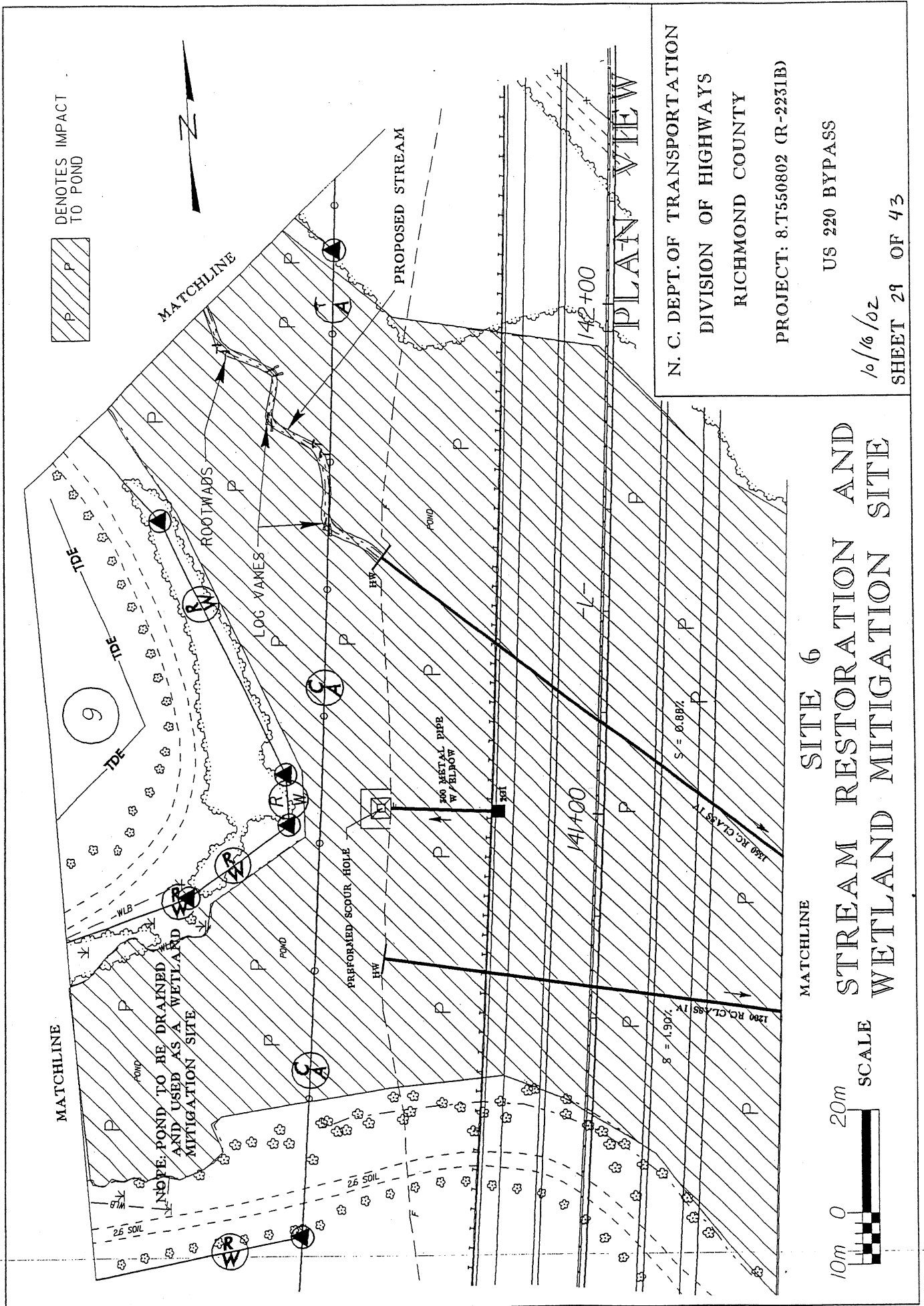
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

10/6/02

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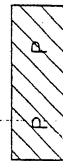


SITE 6 STREAM RESTORATION AND WETLAND MITIGATION SITE

10m 0 20m

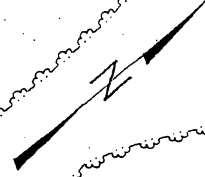


SCALE



P
DENOTES IMPACT
TO POND

PROPOSED STREAM



9

NOTE: POND TO BE DRAINED
AND USED AS A WETLAND
MITIGATION SITE

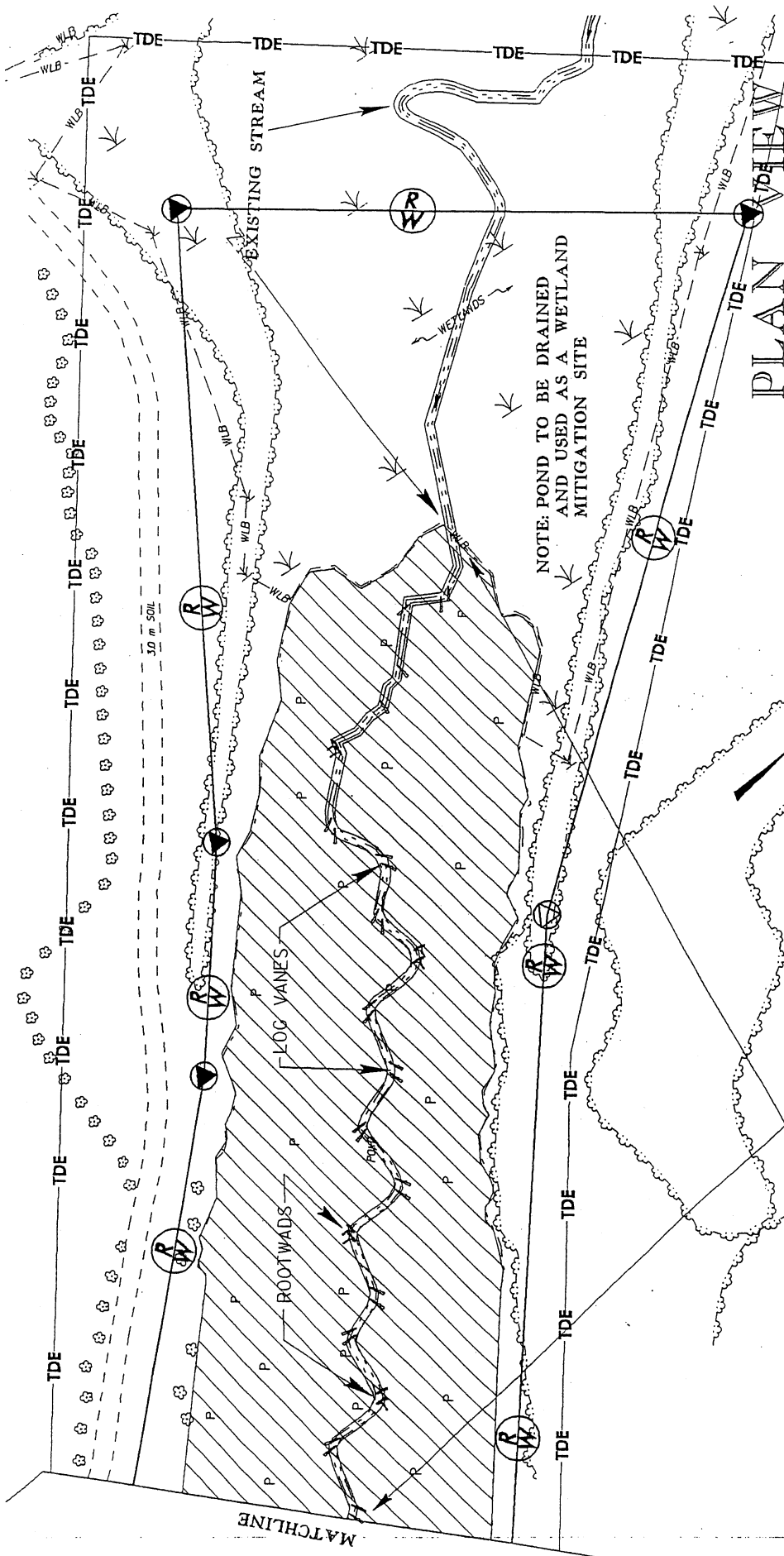
PLAN VIEW

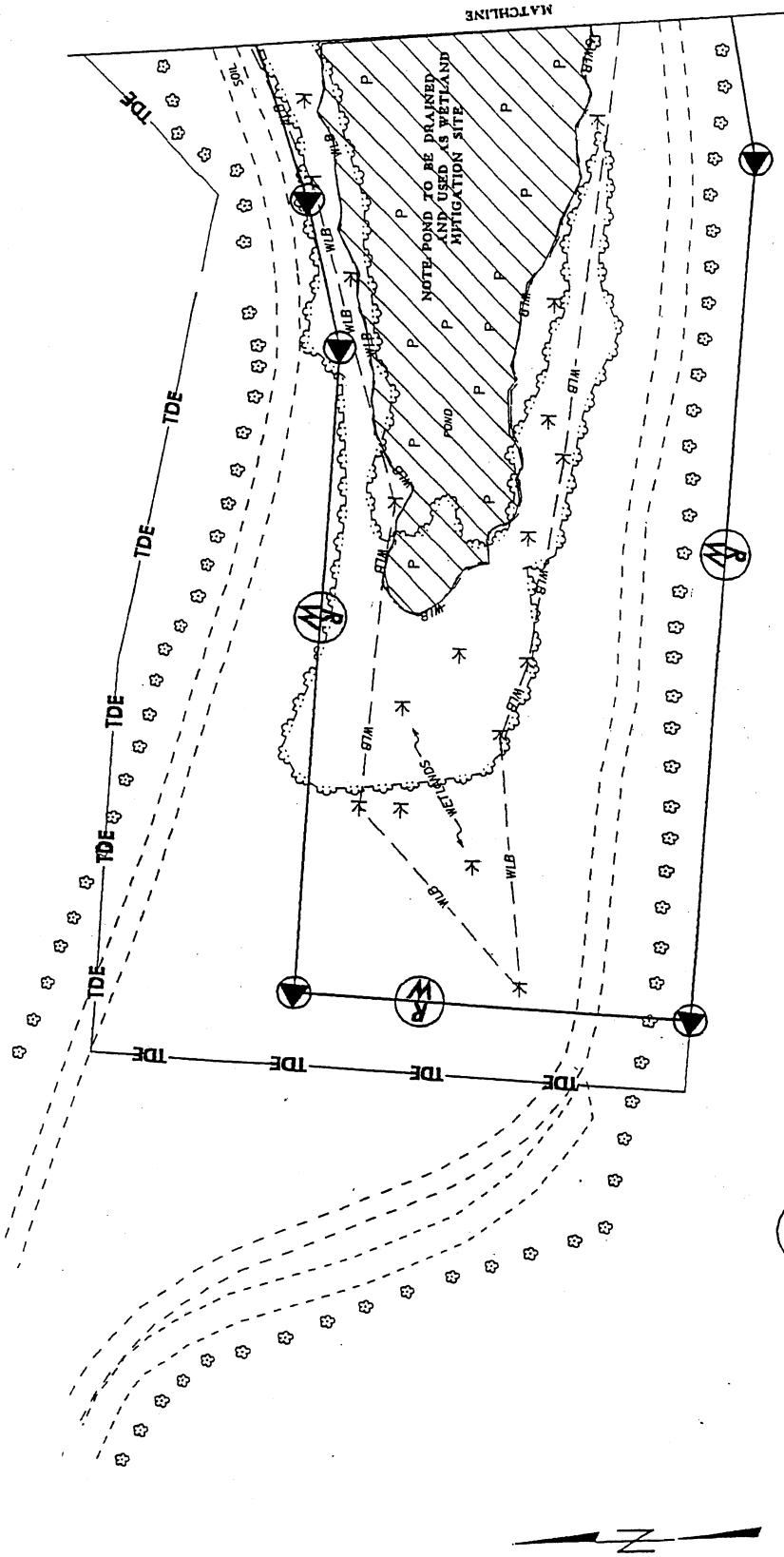
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)

US 220 BYPASS

10/16/02

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PLAN VIEW

N. C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

RICHMOND COUNTY

PROJECT: 8.T550802 (R-2231B)

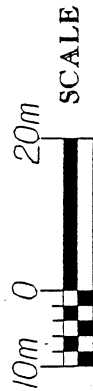
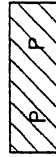
US 220 BYPASS

10/16/02

SHEET 31 OF 43

SITE 6 WETLAND MITIGATION SITE

DENOTES IMPACT
TO POND



Appendix B

Morphological Measurement Table

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach
1. Stream type	E5	E5	N/A	E5
2. Drainage area	160 Ac (0.25mi ²)	160 - 193 Ac		160 Ac (0.25mi ²)
3. Bankfull width	5.1 ft	5.2 ft		5.1ft
4. Bankfull mean depth	0.5 ft	0.4 ft		0.5 ft
5. Width/depth ratio	10.2	13		10.2
6. Bankfull cross-sectional area	2.2 ft ²	2.2 ft ²		2.2 ft ²
7. Bankfull mean velocity	3.7 ft/s	3.7 ft/s		3.7 ft/s
8. Bankfull discharge, cfs	8.1 ft ³ /s	8.1 ft ³ /s		8.1 cfs
9. Bankfull max depth	0.8 ft	0.7 ft		0.8 ft
10. Width of floodprone area	180 ft	150 - 180 ft		180 ft
11. Entrenchment ratio	112	88		112
12. Meander length	40 ft	30 - 50 ft		40 ft
13. Ratio of meander length to bankfull width	7.8	7.7		7.8
14. Radius of curvature	12 ft	12 ft		12 ft
15. Ratio of radius of curvature to bankfull width	2.4	2.3		2.4
16. Belt width	10 - 20 ft	15 - 20 ft		10 - 20 ft
17. Meander width ratio	2.9	3.4		2.9
18. Sinuosity (stream length/valley length)	1.10	1.16		1.10
19. Valley slope	1.30%	1.30%		1.30%
20. Average slope	0.90%	0.80%		0.90%
21. Pool slope	0.30%	0.00%		0.30%
22. Ratio of pool slope to average slope	0.33	0.38		0.33
23. Maximum pool depth	1.4 ft	1.2 ft		1.4 ft
24. Ratio of pool depth to average bankfull depth	2.8	2.2		2.8
25. Pool width	5 - 6 ft	5.8 ft		5 - 6 ft
26. Ratio of pool width to bankfull width	1.08	1.11		1.08
27. Pool to pool spacing	25 ft	25 ft		25 ft
28. Ratio of pool to pool spacing to bankfull width	4.9	4.8		4.9

Ellerbe Bypass Stream Mitigation Site (R-2231B)
Sta 140+00 -L- (Rt) - Sta 143+20 -L- (Lt)

SEDIMENT TRANSPORT ANALYSIS

Station/Description	Flow Depth (ft)	Flow Slope (ft/ft)	Shear Stress (lb/ft ²)	Bed Material	Velocity (ft/s)
Proposed	0.7	0.0080	0.203	Sand/Silt	2.9
Reference	0.8	0.0090	0.229	Sand/Silt	3.0

Note: Velocities determined from HEC-RAS Model

Proposed Morphology

**** Critical Shear Stress** 0.28 lb/ft²

***** Permissible Velocity** 2.0-3.5 ft/s Clear Water Silt Loam - Water w/ Silt Firm Loam

*** Shields:**

Particle Size	8.0	mm
Dimensionless Shear Stress	0.0755	lb/ft ²
Kinematic Viscosity	0.00001400	ft ² /s
Mass Density	1.94	slugs/ft ³
Unit Weight (Particle)	165.0	lb/ft ³
Unit Weight (Water)	62.4	lb/ft ³
Reynolds Number	607.0	

at 50° F

Dimensionless Shear Stress
from Shields Diagram 0.100 lb/ft²

References:

- * Shields Diagram
- ** Hydraulic Engineering (HEC) 15 - Chart 1
- *** Hydraulic Design Series (HDS) 3 - Table 2

<u>Proposed</u>		<u>Reference</u>	
Q _{BKF}	8.1	ft ³ /s	8.1
W/D	13.0		10.2
Side Slope	3:1		Var.
Mannings n	0.035		0.035
Valley Slope	0.0130	ft/ft	0.0130
Sinuosity	1.16		1.10
Valley Slope/Sinuosity	0.0112	ft/ft	0.0118
Velocity	2.9	ft/s	3.0
Area	2.2	ft ²	2.2
W _{BKF}	5.2	ft	5.1
Base Width	1.0	ft	Var. - 2
Mean Depth	0.4	ft	0.5
Wetted Perimeter	5.4	ft	5.4
Hydraulic Radius	0.41	ft	0.41
Shear Stress	0.28	lb/ft ²	0.30
Particle Moved	18.0	mm	16.0
<u>Stream Power:</u>		<u>Reference:</u>	
stream power =		stream power =	
		0.135	
		lb/ft/sec	
<u>Proposed:</u>		<u>Proposed:</u>	
stream power=		stream power=	
		0.113	
		lb/ft/sec	

Sheet 35 of 13

Elev (m)
P-86

165.0000

160.0000

150.0000
0.0000

10.0000

20.0000

30.0000

40.0000

50.0000

60.0000

70.0000

80.0000

90.0000

100.0000

110.0000

120.0000

130.0000

140.0000

150.0000

160.0000

170.0000

180.0000

190.0000

200.00

PROPOSED STREAM GRADE

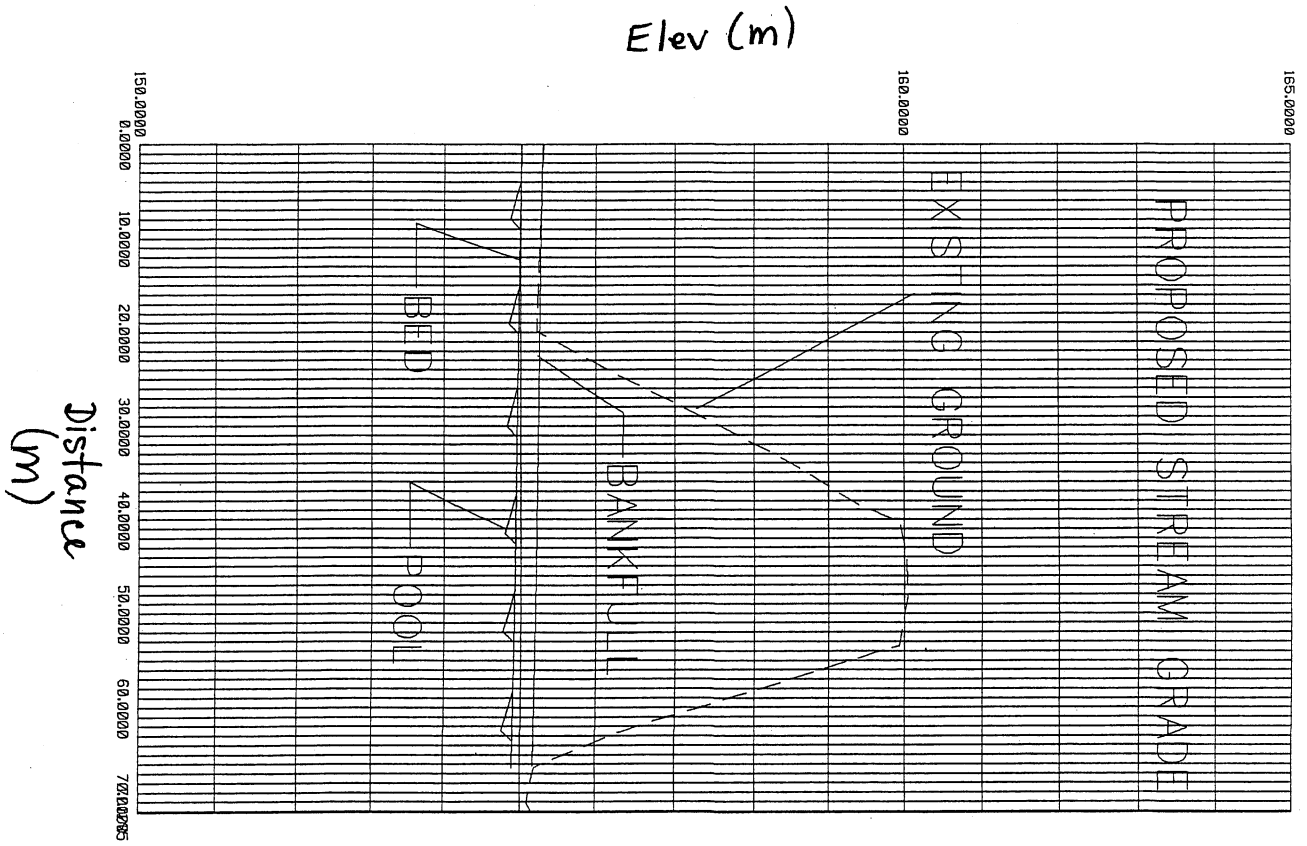
BANKFULL

BED

POOL

EXISTING GROUND

Distance
(m)



2:31 PM10/15/0210/15/02

PROJECT #: 8.T550803 (R-2231B)
COUNTY: RICHMOND
DESCRIPTION: US 220 BYPASS FROM SOUTH OF
SR 1455 TO NORTH OF NC 73
STREAM: TRIBUTARY TO ROCKY FORD BRANCH

NATURAL STREAM DESIGN
Sta 140+60 -L- (Rt) - Sta 144+00 -L- (Lt)

The proposed new location of the US 220 Bypass (Ellerbe Bypass) will result in the impact (draining) of an existing pond at Sta 141+00 -L-. Once the pond is drained, it is proposed to use the area as a mitigation site including the construction of a natural stream. The stream that feeds the pond is a tributary to Rocky Ford Branch. The stream will be designed/classified based on Dave Rosgen's principles and techniques for river morphology.

The existing stream drains 160 acres at the head of the pond up to 193 acres at the outlet. The basin is rural and is located in the Sandhills hydrologic region. The basin drains pine/hardwood forest and agricultural fields. The existing stream was determined stable, undisturbed and was therefore used for the reference stream. The reference reach was located at the head of the existing pond.

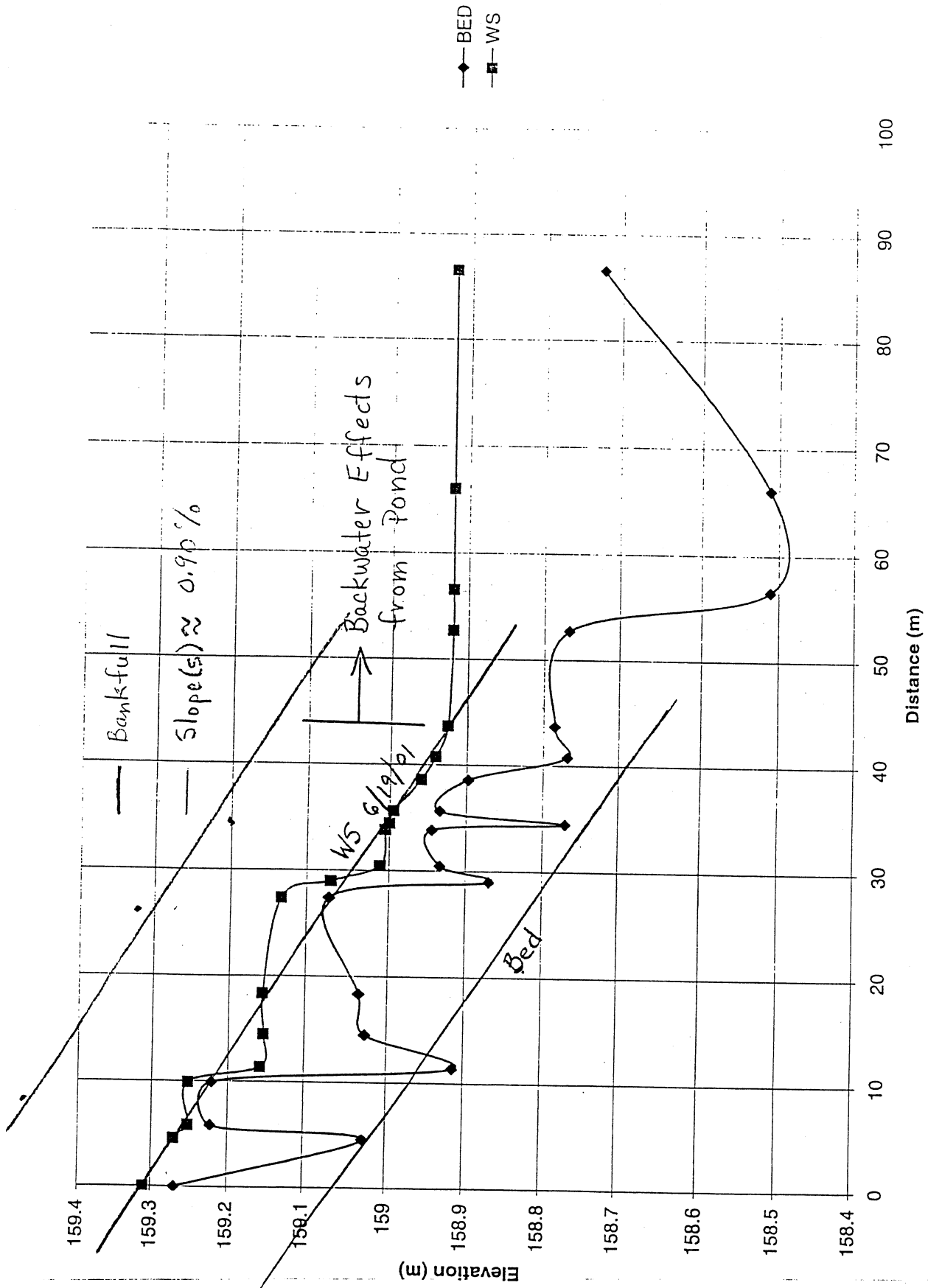
The stream reference reach was surveyed to determine its morphological characteristics. These characteristics include bankfull area, depth, width and discharge. This information was then compared to data generated from the NC Stream Restoration Institute's regional equations for bankfull characteristics. The Piedmont region was used with the NCSRI equations and prorated for the Sandhills region. The USGS Rural WRI Report 99-4114 was used to establish the prorated ratios between the Piedmont and Sandhills regions. Data was also analyzed using the HEC-RAS modeling system to compare the accuracy of the characteristics between the surveyed reach and the regional equations.

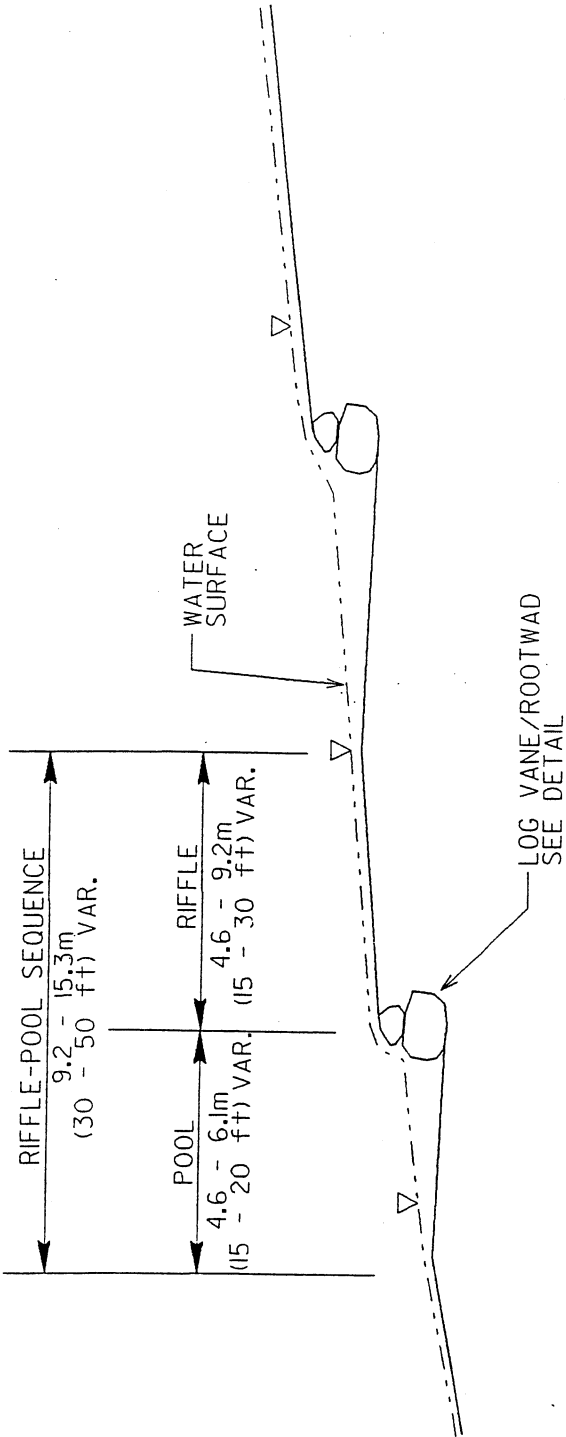
The reference reach bed material was found to be fine to medium sand. The shear stress and sediment transport properties for sand were analyzed. Shear stresses for the proposed and reference stream were calculated based on velocities and flow depths generated from the HEC-RAS modeling system. This information was then compared to values for critical velocity and shear stress for sand in the HEC-15 and HDS-5 manuals from the FHA. The comparison showed the proposed stream to be within acceptable velocity and shear stress limits that would allow proper sediment transport under bankfull conditions. Sediment transport characteristics were also analyzed using the Shields diagram. This also showed the fine to medium sand being moved under the bankfull conditions.

2:31 PM 10/15/02 10/15/02

The proposed stream was designed to retain the bankfull characteristics of the reference stream. To aid in bank stability, log vanes and rootwads are proposed in the bend/pool areas. Also, permanent soil reinforcement mat will be placed on the banks along the entire proposed reach. This will enable vegetation to establish along the stream banks.

Based on surveyed data in the field and analyzed information provided by the NCSRI, the tributary to Rocky Ford Branch was classified as an E5 stream. According to Rosgen's **Applied River Morphology**, E5 streams are characterized as "hydraulically efficient channel forms" with a "high sediment transport capacity" and a "high resistance to plan form adjustment which results in channel stability without significant downcutting." They are found in broad alluvial valleys with well developed floodplains. The stream banks "are composed of materials finer than that of the dominant channel bed materials and are typically stabilized with extensive riparian or wetland vegetation that forms densely rooted sod mats from grasses, as well as woody species." The E5 stream retains these very stable characteristics "unless the stream banks are disturbed and significant changes in sediment supply and/or streamflow occur."





N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550802 (R-2231B)
US 220 BYPASS

RIFFLE-POOL SPACING
SITE 6
NOT TO SCALE

PARCEL NO.	PROPERTY OWNER NAME	PROPERTY OWNER ADDRESS
①	EMMA & ROLYN ELLERBE	RT 4 BOX 295 WADESBORO, N.C. 28170
②	JOSEPH G. JR. & BETTY DAVIS	915 MORNINGSIDE DR. ROCKINGHAM, N.C. 28379
③	ROBERT LEE & BRENDA KAY THORSBY	PO BOX 212 ELLERBE, N.C. 28338
④	MELVIN G ELLINGER	PO BOX 1152 ELLERBE, N.C. 28338
⑤	DUNCAN H & CHARLOTTE Q GRANT	1836 N. US. HWY 220 ELLERBE, N.C. 28338
⑥	NEAL HAYWOOD GRANT	1836 N. US. HWY 220 ELLERBE, N.C. 28338
⑦	DANIEL BROWN JR	PO BOX 604 ELLERBE, N.C. 28338
⑧	BOBBY ANN NICHOLSON TERRY	PO BOX 352 ELLERBE, N.C. 28338
⑨ & ⑩	JUANITA ASKEW	1230 SQUIRREL HILL RD. CHARLOTTE, N.C. 28213
⑪	HAROLD JEROME NICHOLSON	PO BOX 152 ELLERBE, N.C. 28338
⑫	WALTER RAY & EMMA STANCIL	127 STANCIL DR. ELLERBE, N.C. 28338
⑬	ANNIE JORDAN BUIE	PO BOX 216 ELLERBE, N.C. 28338
⑭	ANTHONY A & BRENDA CAPEL	PO BOX 462 ELLERBE, N.C. 28338
⑰ & ⑱	ROGER H ALLRED SR	6726 LANCER DR. CHARLOTTE, N.C. 28226
⑳	JOHN B & BETTY PARKER	109 PATTERNOTE RD. MOORESVILLE, N.C. 2815
㉔	LESTER WILLIAM HINES	840 CAPEL MILL RD. ELLERBE, N.C. 28338

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231B

US 220 BYPASS

9/02

SHEET 40 OF 43

[illegible]

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY

PROJECT R-2231B

US 220 BYPASS

9/02

SHEET 41 OF 43

WETLAND PERMIT IMPACT SUMMARY												
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS			SURFACE WATER IMPACTS						
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)	
1A	68+12 - 68+74 -L-	2@9'X8'	1.01		0.52	0.11	0.07				571	
1B	85+60 - 86+04 -L-	48" RCP	0.18			0.1	0.04				292	
1C	90+08 - 90+20 -L-	N/A	0.22			0.02						
1	91+20 - 94+00 -L-	30" RCP	1.7			0.16					663	
2	103+80 - 105+20 -L-	3@36" RCP	1.34			0.06						
3	106+60 - 110+00 -L-	42" RCP	2.41			0.23					328	
4	22+80 - 23+20 -Y4REV-	36" RCP	0.2			0.05						
5	135+00 - 137+00 -L-	30" RCP						3				
*6	140+00 - 142+00 -L-	54" RCP						9.36				1066
										</		

• WETLAND SITE 6 MITIGATION ESTIMATE = 3.12 AC

Form Revised 3/22/01

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS			SURFACE WATER IMPACTS					Natural Stream Design (m)
			Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Temp. Fill In SW (ha)	Existing Channel Impacted (m)	
1A	68+12 - 68+74 - L-	2@2.7mX2.4m	0.41		0.211	0.045	0.028			174	
1B	85+60 - 86+04 - L-	1200 RCP	0.39			0.041	0.017			89	
1C	90+08 - 90+20 - L-	N/A	0.087			0.008					
1	91+20 - 94+00 - L-	750 RCP	0.688			0.063				202	
2	103+80 - 105+20 - L-	3@900 RCP	0.543			0.023					
3	106+60 - 110+00 - L-	1050 RCP	0.976			0.094				100	
4	22+80 - 23+20 - Y4REV-	900 RCP	0.082			0.021					
5	135+00 - 137+00 - L-	750 RCP						1.21			
* 6	140+00 - 142+00 - L-	1350 RCP						3.79			325
TOTALS:			3.176	0	0.211	0.295	0.045	5.00	0	565	325

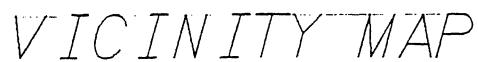
NCDOT
 DIVISION OF HIGHWAYS
 RICHMOND COUNTY
 PROJECT 8.T550802 (R-2231B)

11/02

SHEET 43 OF 43

* WETLAND SITE 6 MITIGATION ESTIMATE = 1.27 Ha

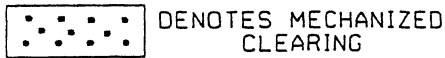
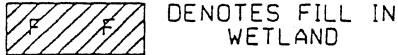
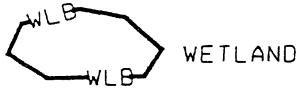
Form Revised 3/22/01



SHEET 1 OF 14

WETLAND LEGEND

— WLB — WETLAND BOUNDARY



— — — FLOW DIRECTION

— TB — TOP OF BANK

— WE — EDGE OF WATER

— C — PROP. LIMIT OF CUT

— F — PROP. LIMIT OF FILL

— Δ — PROP. RIGHT OF WAY

— NG — NATURAL GROUND

— PL — PROPERTY LINE

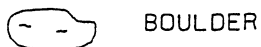
— TDE — TEMP. DRAINAGE EASEMENT

— PDE — PERMANENT DRAINAGE EASEMENT

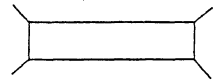
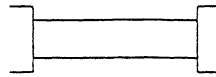
— EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

— EPB — EXIST. ENDANGERED PLANT BOUNDARY

— ∇ — WATER SURFACE



— — — CORE FIBER ROLLS

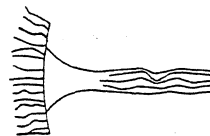


(DASHED LINES DENOTE EXISTING STRUCTURES)

12"-48" PIPES
54" PIPES & ABOVE



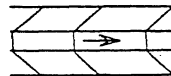
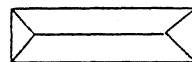
— — — WOODS LINE



ROOTWAD



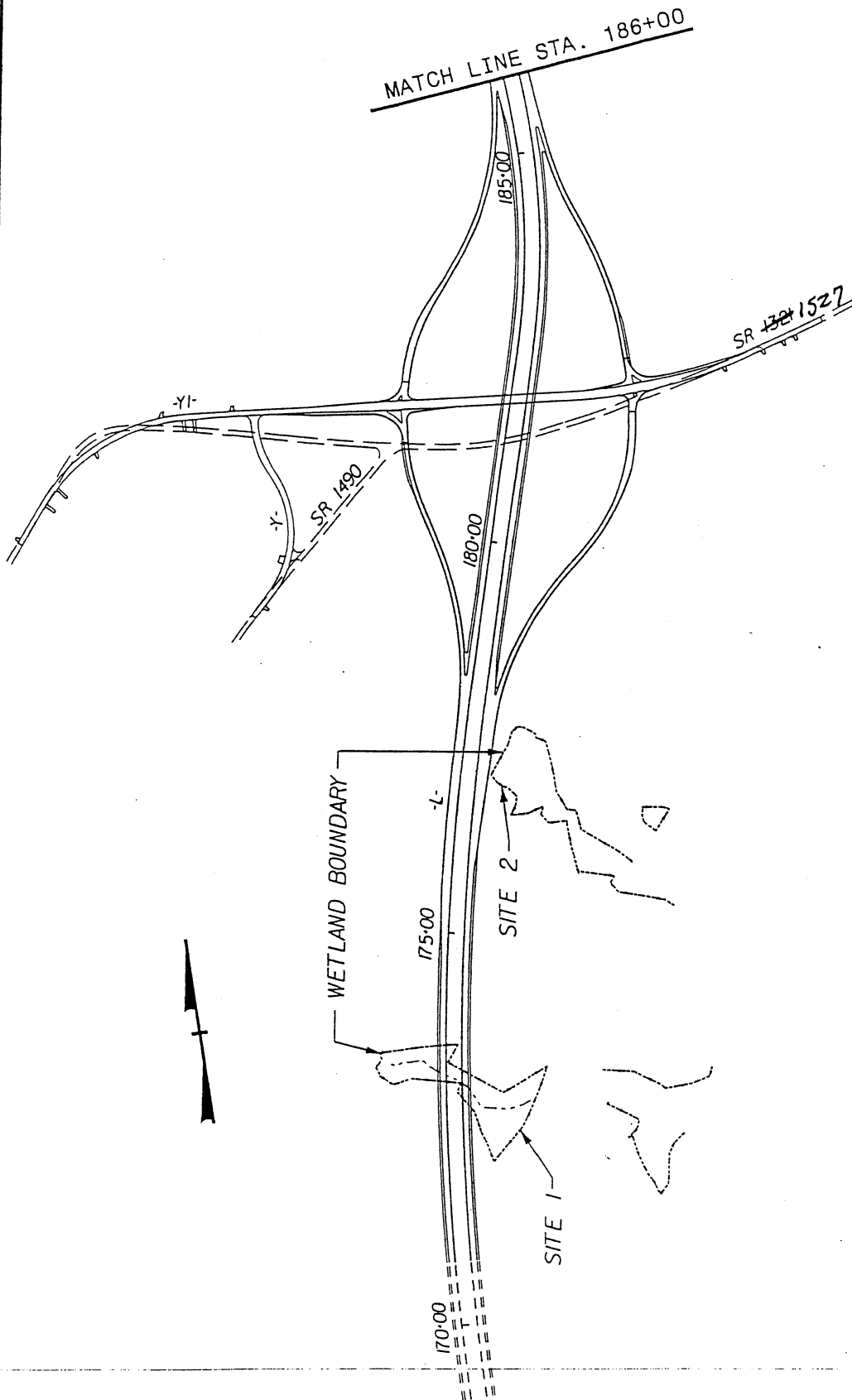
ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND/MONTGOMERY COUNTIES

PROJECT: 8.T550803 (R-2231CA)

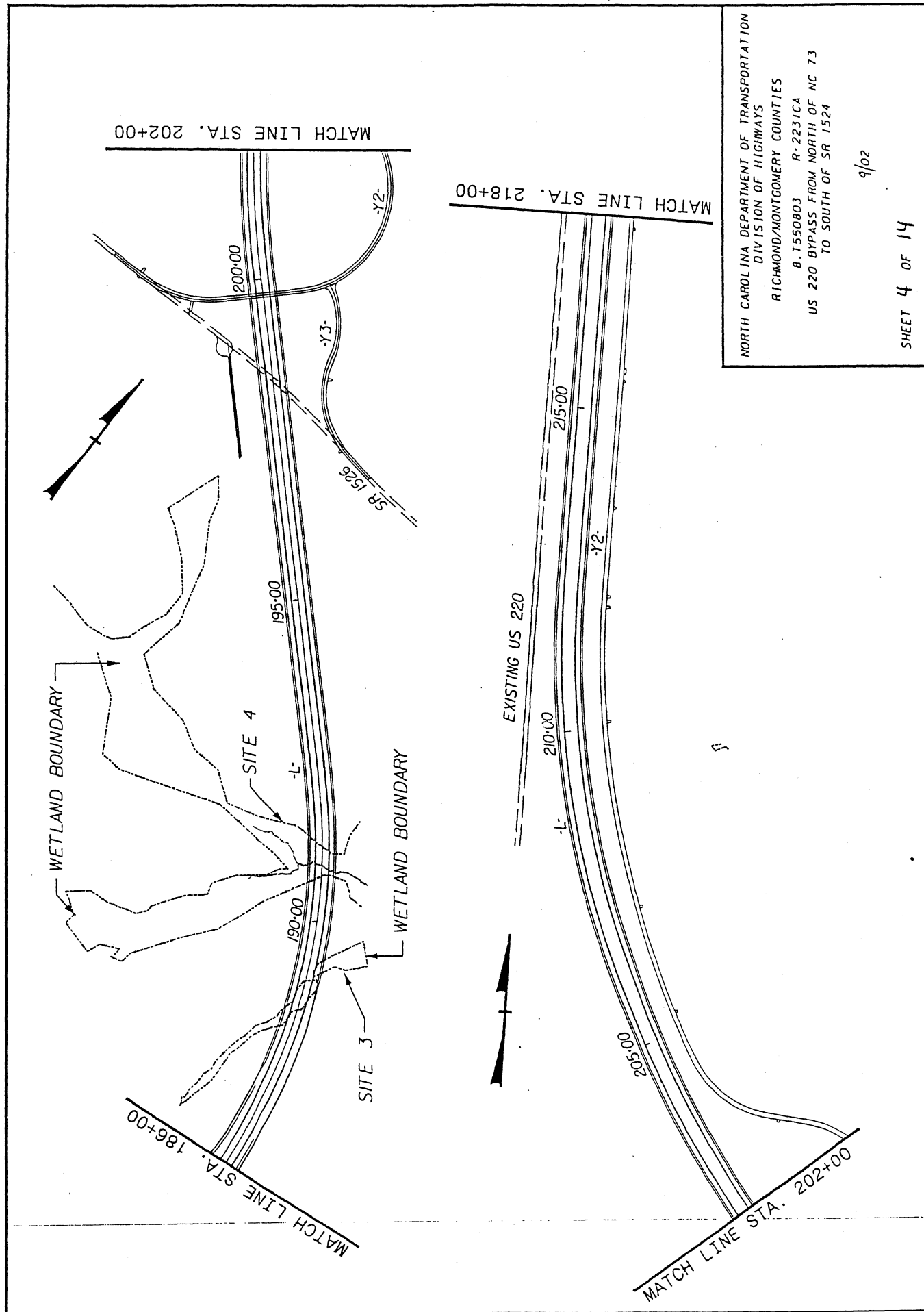
US 220 BYPASS
FROM NORTH OF NC 73 TO
SOUTH OF SR 1524

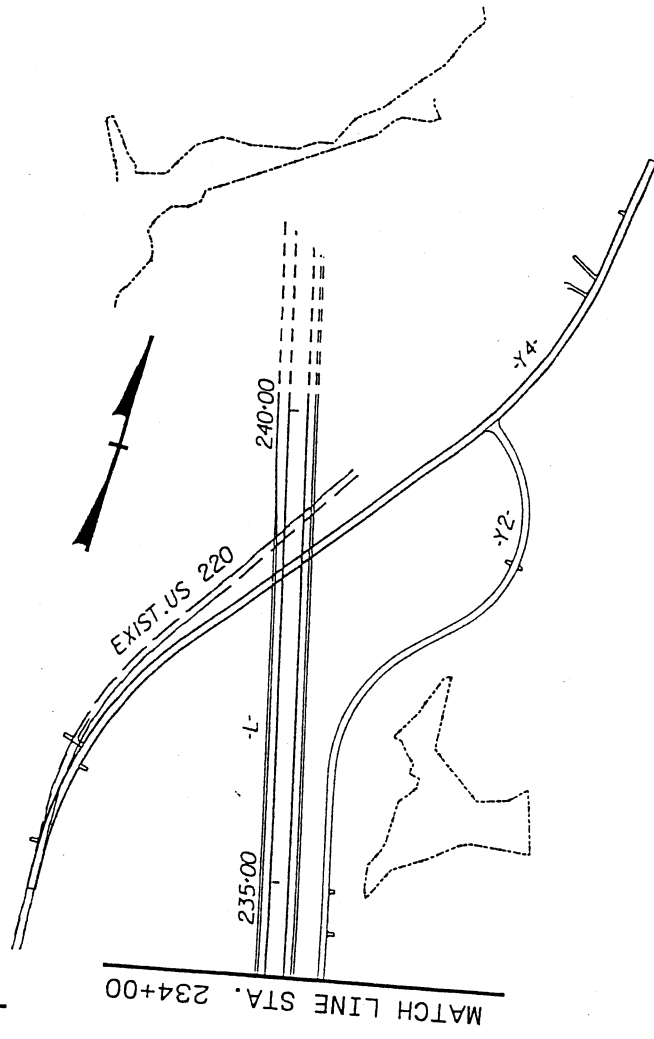
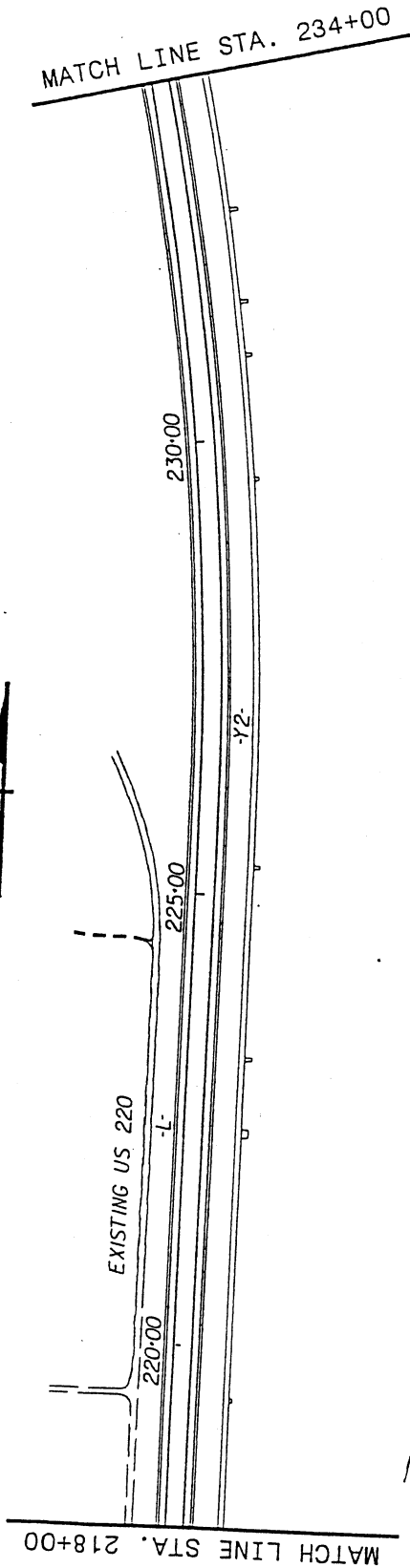


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND/MONTGOMERY COUNTIES
B.T550803 R-2231CA
US 220 BYPASS FROM NORTH OF NC 73
TO SOUTH OF SR 1524

9/02

SHEET 3 OF 14



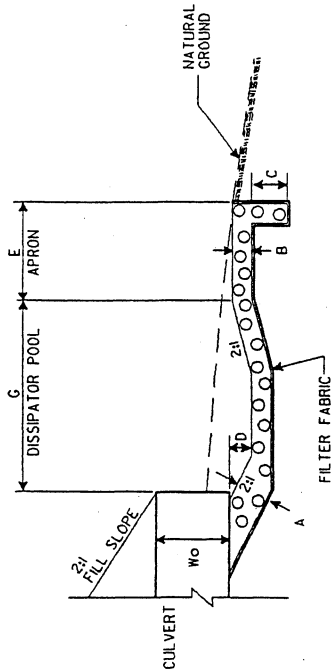


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND/MONTGOMERY COUNTIES
B. T550803 R-2231CA
US 220 BYPASS FROM NORTH OF NC 73
TO SOUTH OF SR 1524

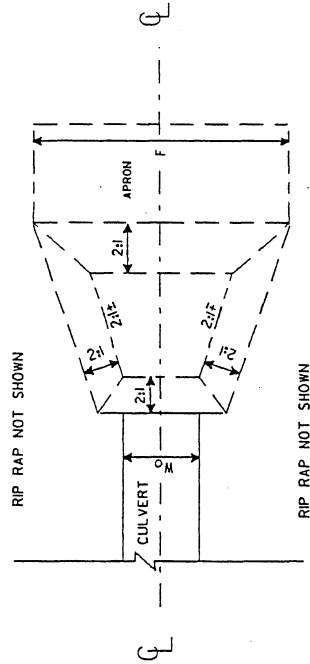
9/02

SHEET 5 OF 14

Q SECTION



HALF PLAN



DIM.	1	2	3	4	5
RIP RAP BASIN #					
(m)					
A	0.60	0.60	0.60	0.60	0.60
B	0.40	0.40	0.40	0.40	0.40
C	1.20	1.20	1.20	1.20	1.20
D	0.60	0.60	0.60	0.60	0.60
E	3.0	3.0	3.0	3.0	3.0
F	6.0	6.0	6.0	6.0	6.0
G	6.0	6.0	6.0	6.0	6.0

ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	Sta 173+40 -L- (Rt)
2	Sta 176+60 -L- (Rt)
3	Sta 189+10 -L- (Rt)
4	Sta 191+80 -L- (Rt)
5	Sta 1+70 -RPC- (Rt)

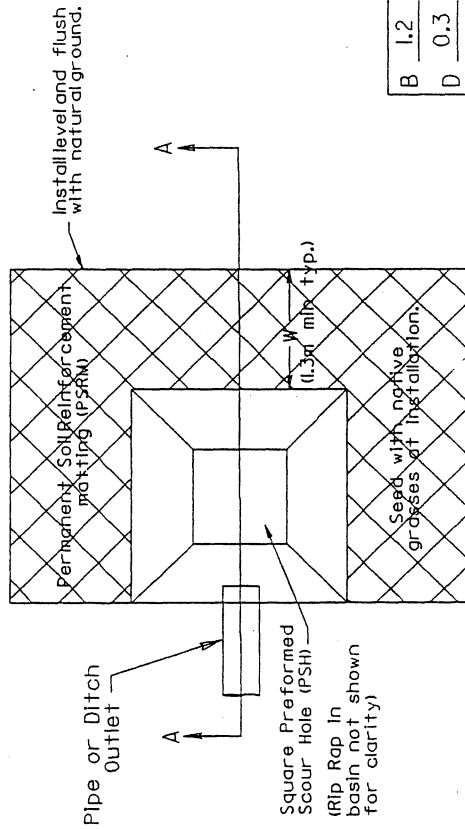
DETAIL OF RIP-RAPPED OUTLET ENERGY DISSIPATOR BASIN

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RALEIGH, N.C.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND / MONTGOMERY
COUNTY
PROJECT: 8.T550803 (R-2231CA)
US 220 BYPASS FROM NORTH OF
NC 73 TO SOUTH OF SR 1524

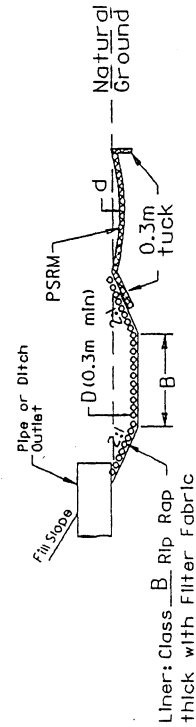
PREFORMED SCOUR HOLE

PLAN VIEW

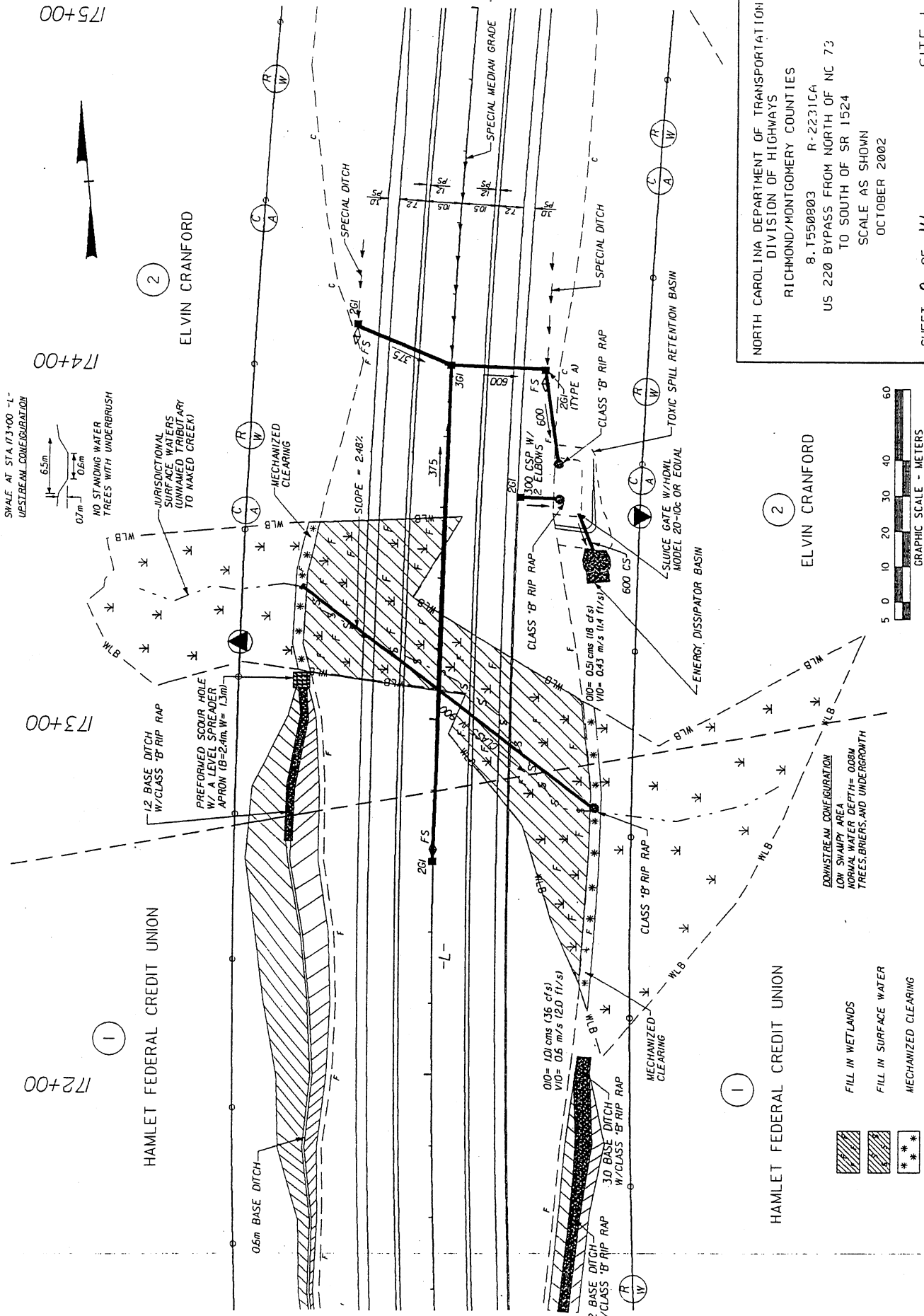


B	1.2
D	0.3
W	1.3
d	0.075

SECTION A-A

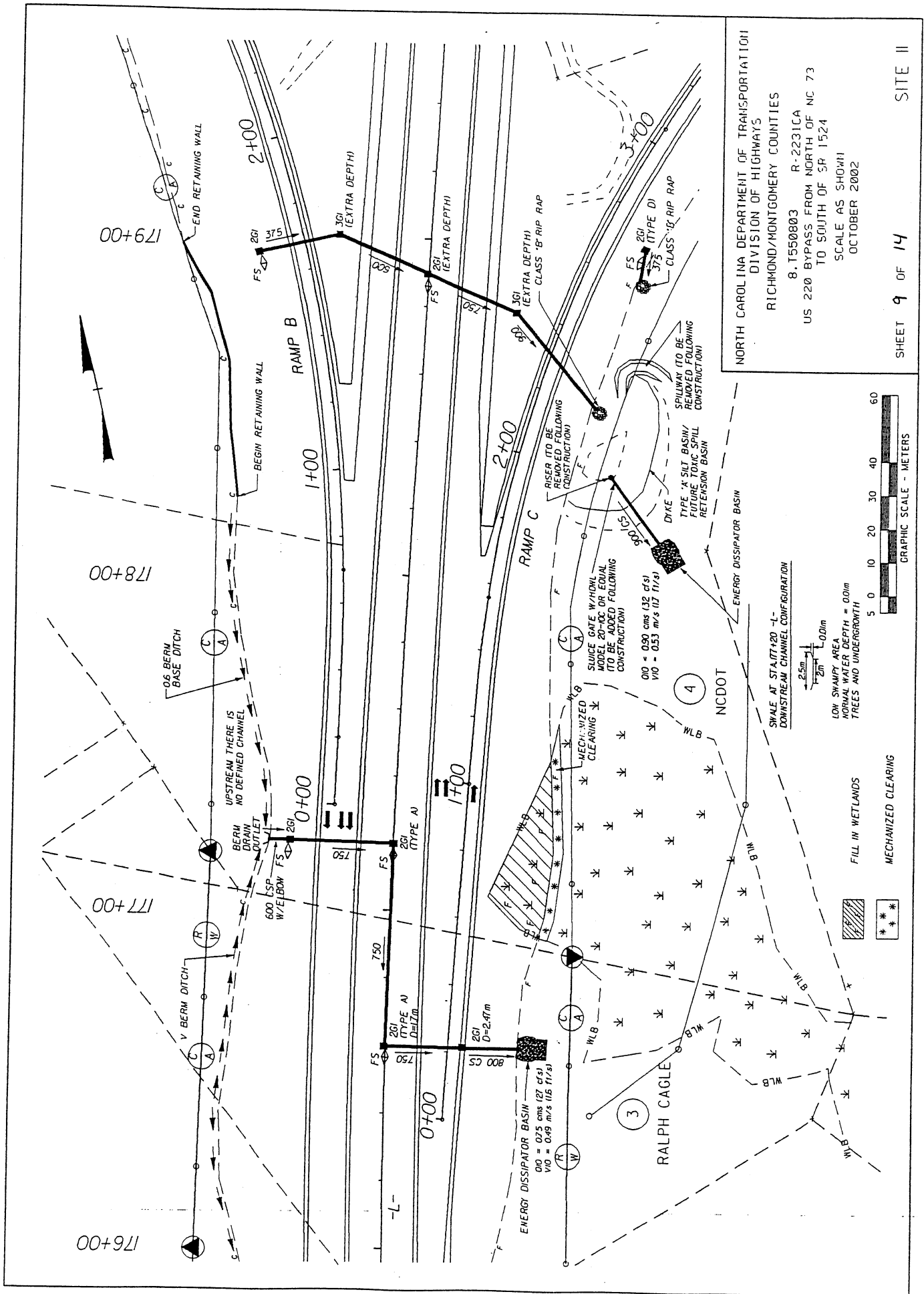


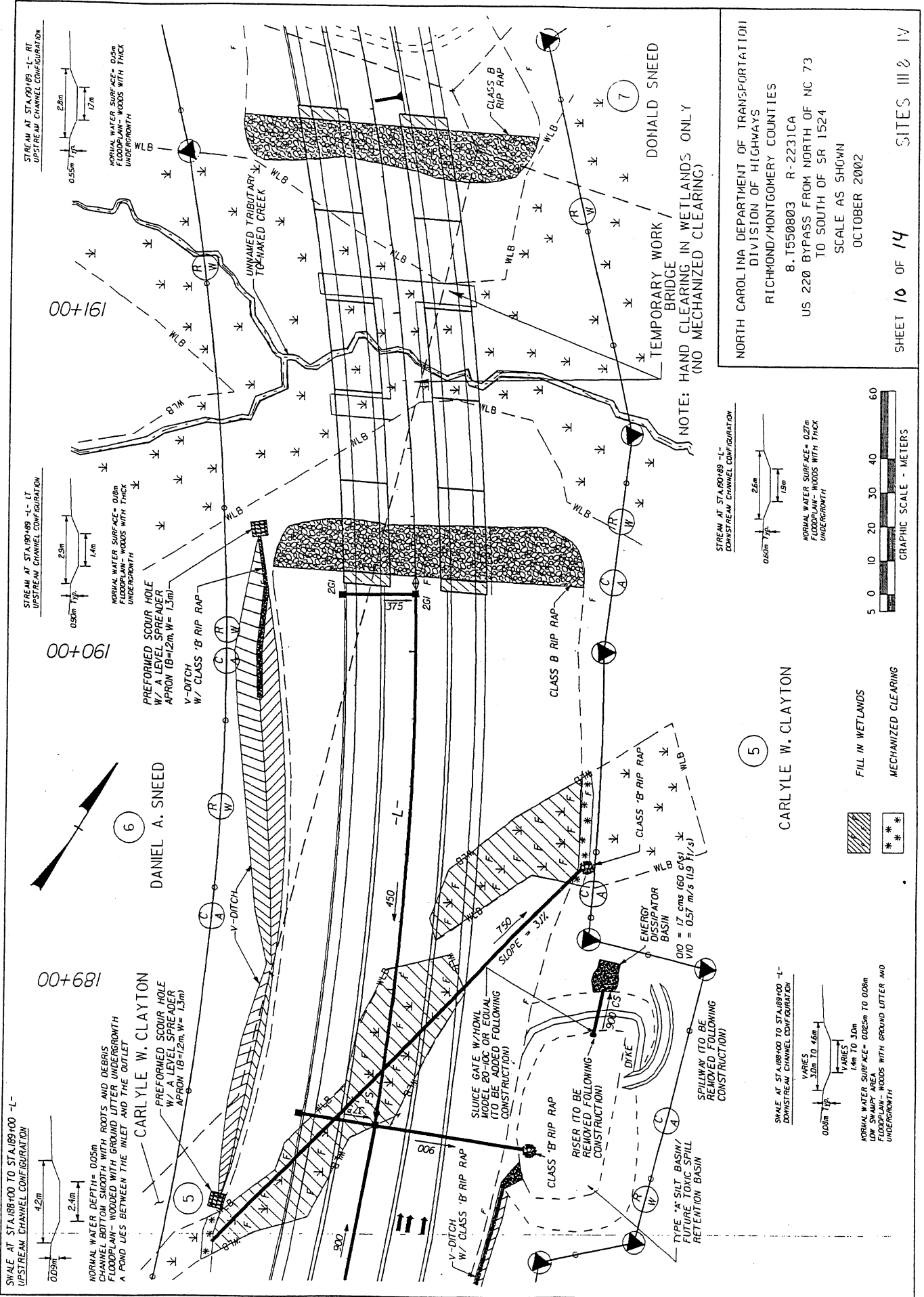
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND / MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CA)
US 220 BYPASS FROM NORTH OF NC 73 TO SOUTH OF SR 1524



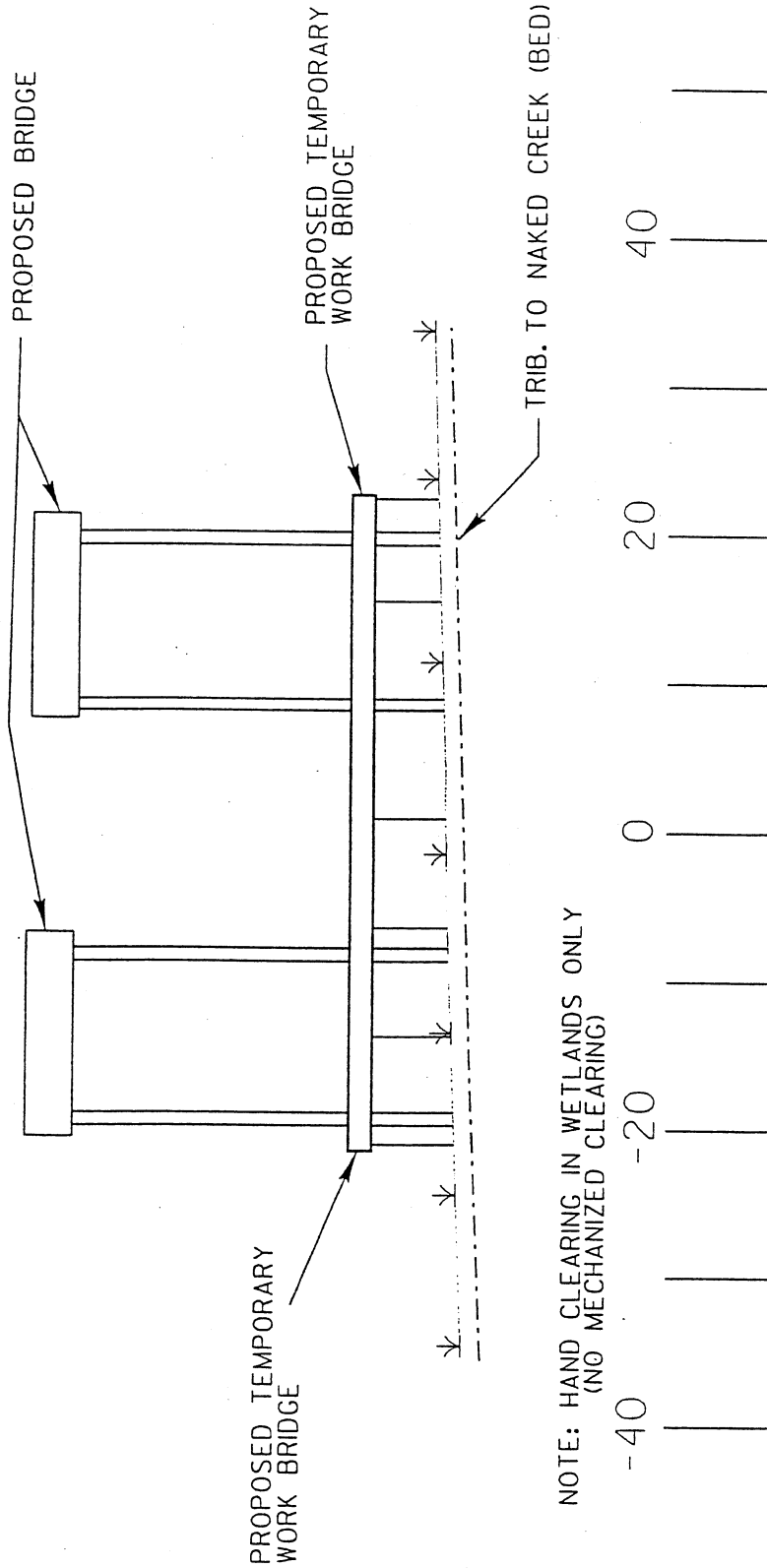
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND/MONTGOMERY COUNTIES
B. T550803 R-2231CA
US 220 BYPASS FROM NORTH OF NC 73
TO SOUTH OF SR 1524
SCALE AS SHOWN
OCTOBER 2002

SHEET 8 OF 14 SITE 1





TYPICAL SECTION OF BRIDGE



170

165

160

155

150

40

20

0

-20

-40

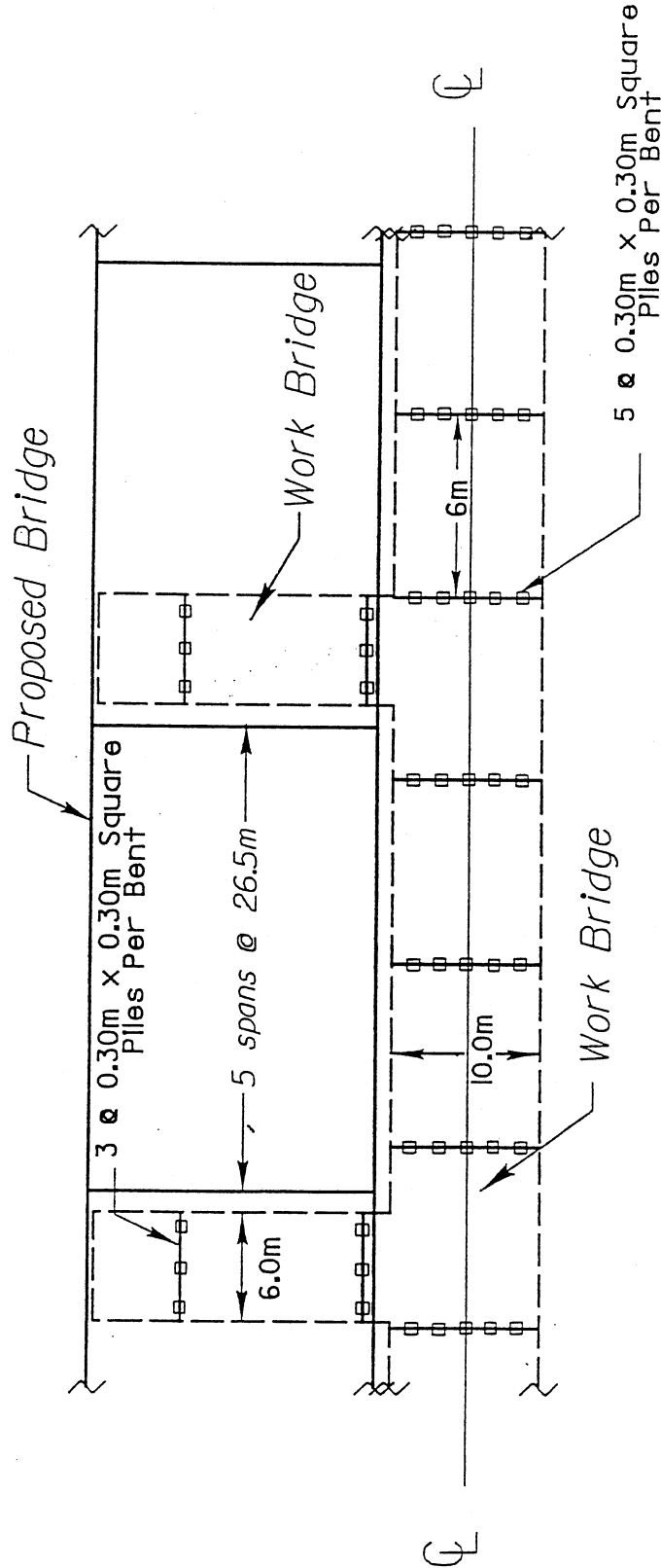
CROSS SECTION



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND / MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CA)
US 220 BYPASS FROM NORTH
OF NC 73 TO SOUTH OF SR 1524
SHEET 11 OF 14

9/02

NOTE: HAND CLEARING IN WETLANDS ONLY
(NO MECHANIZED CLEARING)



TYPICAL WORK BRIDGE

(NOT TO SCALE)

Permanent Fill In Wetlands (Piles)
- Negligible Due to 0.3m HP Steel Piles

Temporary Fill In Wetlands (Piles)
(112 piles)(0.30mx0.30m) = 10.0 sq.m.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND / MONTGOMERY COUNTY

PROJECT: 8.T550803 (R-2231CA)

US 220 BYPASS FROM NORTH
OF NC 73 TO SOUTH OF SR 1524

SHEET 12 OF 14

9/02

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				Natural Stream Design (m)
			Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Temp. Fill In SW (ha)	Existing Channel Impacted (m)	
I	173+00 +/- -L-	900mm RCP	0.3652	-	-	0.039	0.0064	-	-	106.97	-
II	177+00 +/- -L- RT	800mm CSP	0.0515	-	-	0.018	-	-	-	-	-
III	188+20 +/- -L- LT TO 189+60 +/- -L- RT	750mm RCP	0.2645	-	-	0.014	-	-	-	-	-
IV	190+89 +/- -L-	DUAL BRIDGES	-	-	-	-	-	-	-	-	-
TOTALS:			0.6812	-	-	0.071	0.0064	-	-	106.97	-

Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
I	173+00 +/- -L-	36 in RCP	0.9020	-	-	0.100	0.016	-	-	351	-
II	177+00 +/- -L- RT	30 in CSP	0.1270	-	-	0.050	-	-	-	-	-
III	188+20 +/- -L- LT TO 189+60 +/- -L- RT	30 in RCP	0.6540	-	-	0.035	-	-	-	-	-
IV	190+89 +/- -L-	DUAL BRIDGES	-	-	-	-	-	-	-	-	-
TOTALS:			1.6830	-	-	0.185	0.016	-	-	351	-

NCDOT

DIVISION OF HIGHWAYS
 RICHMOND/MONTGOMERY COUNTIES
 PROJECT 8.T550803 (R-2231CA)
 US 220 BYPASS FROM NORTH OF
 NC 73 TO SOUTH OF SR 1524

PROPERTY OWNERS

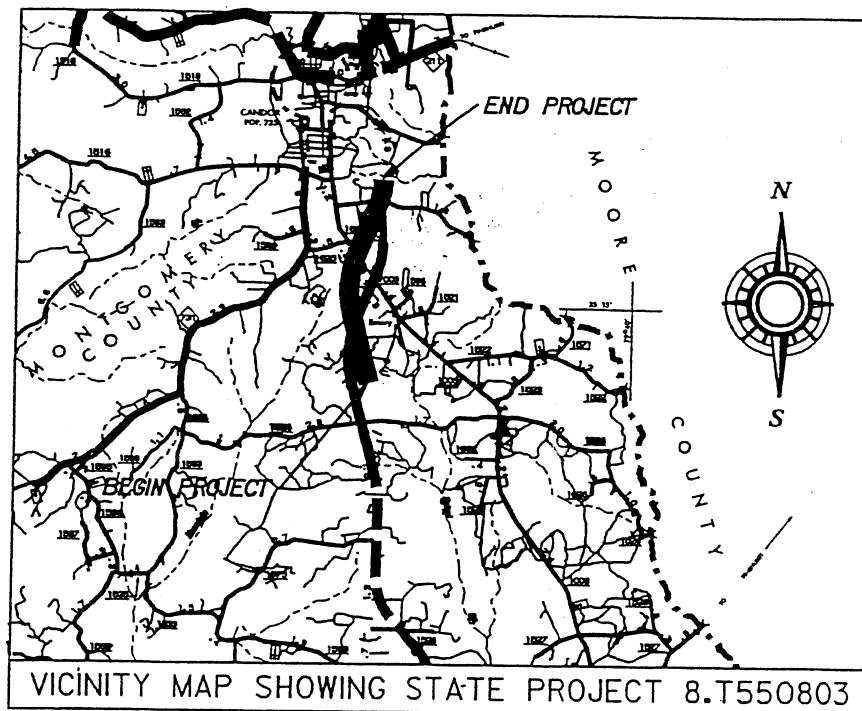
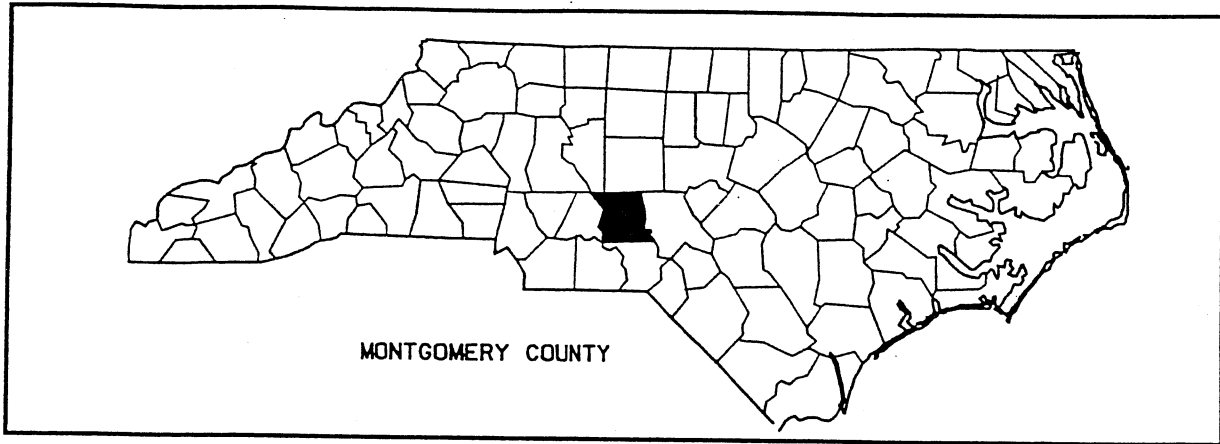
PARCEL	OWNERS NAME	ADDRESS
1	HAMLET FEDERAL CREDIT UNION DB. 0744-0255	P.O. BOX 271, HAMLET, NC 28345
2	ELVIN CRANFORD DB. 0468-0048	P.O. BOX 85, NORMAN, NC 28367
3	RALPH CAGLE DB. 0540-0503	BOX 113, NORMAN, NC 28367
4	NCDOT	
5	CARLYLE W. CLAYTON DB. 0156-0065	501 E. WHITAKERMILL ROAD, RALEIGH, NC 27608
6	DANIEL A. SNEED DB. 0097-0105	173 SNEED DRIVE, CANDOR, NC 27229
7	DONALD SNEED DB. 0137-399	322 MORGAN ROAD, CANDOR, NC 27229

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND/MONTGOMERY COUNTIES

8. T550803 R-2231CA
US 220 BYPASS FROM NORTH OF NC 73
TO SOUTH OF SR 1524

SEPTEMBER 2002

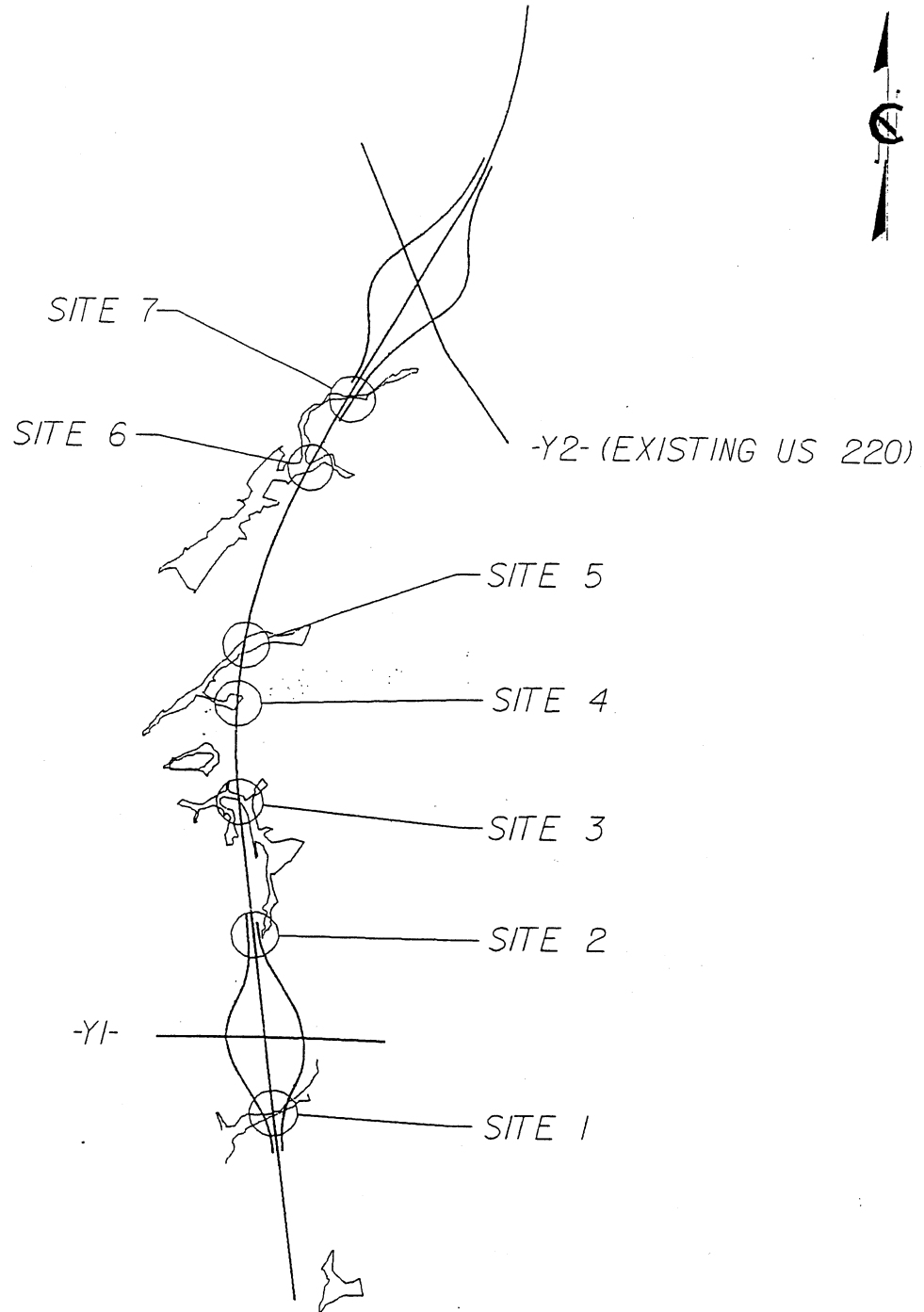
SHEET 14 OF 14



VICINITY MAPS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS



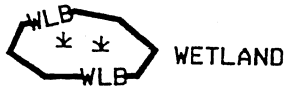
SITE MAP

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS

LEGEND

—WLB— WETLAND BOUNDARY



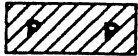
WETLAND



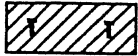
DENOTES FILL IN WETLAND



DENOTES FILL IN SURFACE WATER



DENOTES FILL IN SURFACE WATER (POND)



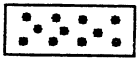
DENOTES TEMPORARY FILL IN WETLAND



DENOTES EXCAVATION IN WETLAND



DENOTES TEMPORARY FILL IN SURFACE WATER



DENOTES MECHANIZED CLEARING

—>—>— FLOW DIRECTION

—TB— TOP OF BANK

—WE— EDGE OF WATER

—C— PROP. LIMIT OF CUT

—F— PROP. LIMIT OF FILL

▲ PROP. RIGHT OF WAY

—NG— NATURAL GROUND

—PL— PROPERTY LINE

—TDE— TEMP. DRAINAGE EASEMENT

—PDE— PERMANENT DRAINAGE EASEMENT

—EAB— EXIST. ENDANGERED ANIMAL BOUNDARY

—EPB— EXIST. ENDANGERED PLANT BOUNDARY



WATER SURFACE

LIVE STAKES



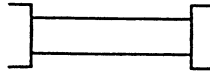
BOULDER



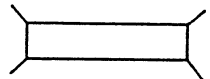
COIR FIBER ROLLS



ADJACENT PROPERTY OWNER OR PARCEL NUMBER



PROPOSED BRIDGE



PROPOSED BOX CULVERT



PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTING STRUCTURES)

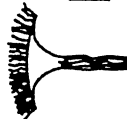


SINGLE TREE

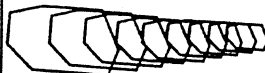
WOODS LINE



DRAINAGE INLET



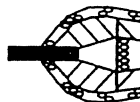
ROOTWAD



VANE



RIP RAP



RIP RAP ENERGY DISSIPATOR BASIN

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

MONTGOMERY COUNTY

PROJECT: 8.T550803

PROPERTY OWNERS

NAMES AND ADDRESSES

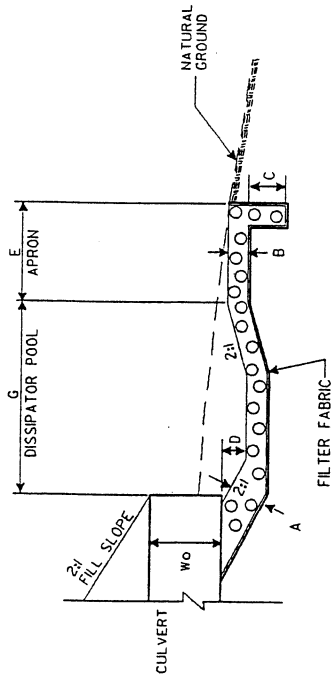
PARCEL NO.	NAMES	ADDRESSES
1	STANLY RICHMOND & CO.	PO BOX 1267 ROCKINGHAM, NC 27379
2	GERALD L. FERGUSON	BOX 64 WILLIARD, KY 41181
3	CLIFTON BAKER	482 SURRETT RD. DENTON, NC 27239
4	ROBERT D. JOHNSON	RT. 2, BOX 42 CANDOR, NC 27229
5	CATAWBA NEWSPRINT CO.	PO BOX 7 CATAWBA, SC 29704
6	NC HIGHWAY DEPARTMENT	
7	CLAUDE W. HICKS	RT3 BOX 342 CANDOR, NC 27229

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

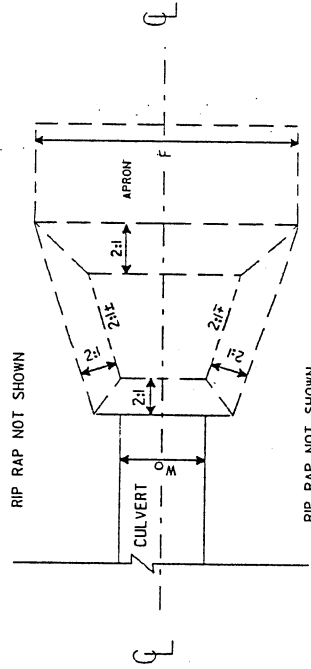
PROJECT: 8.T550803 (R2231CB)

US 220 BYPASS

Q SECTION



HALF PLAN



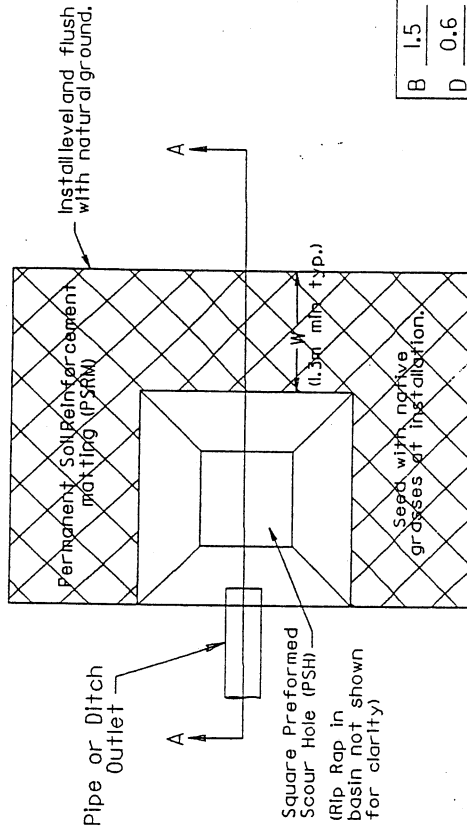
DETAIL OF RIP-RAPPED OUTLET ENERGY DISSIPATOR BASIN

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RALEIGH, N.C.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CB)
US 220 BYPASS

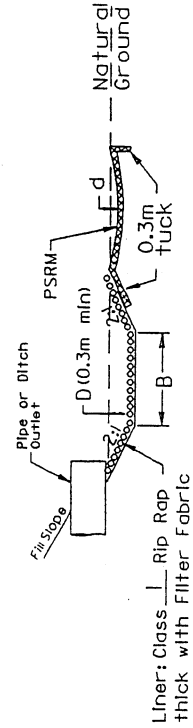
PREFORMED SCOUR HOLE

PLAN VIEW



B	1.5
D	0.6
W	2.0
d	0.15

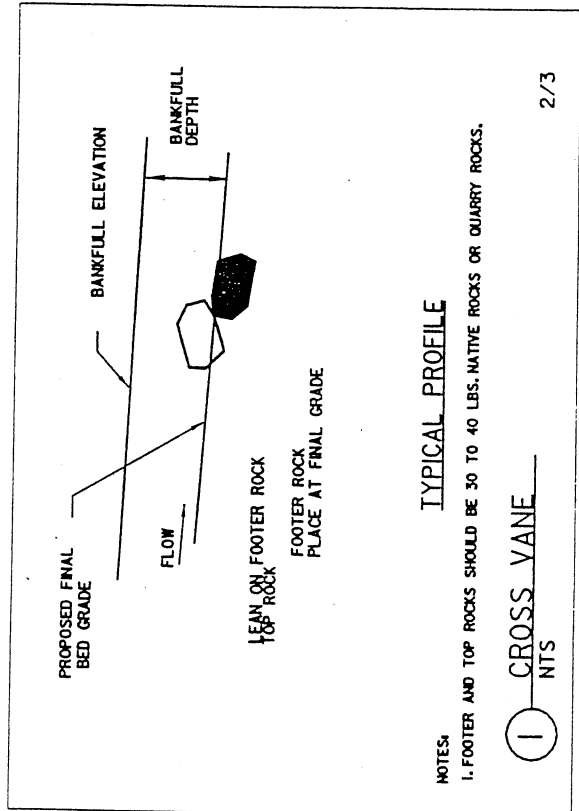
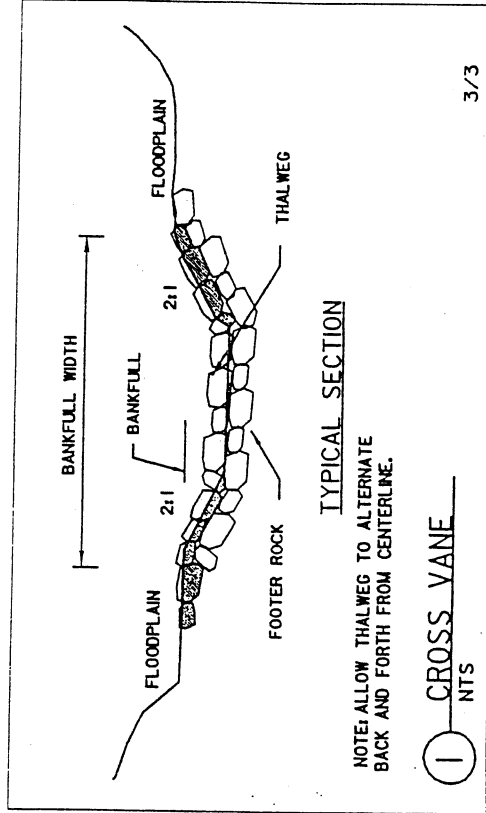
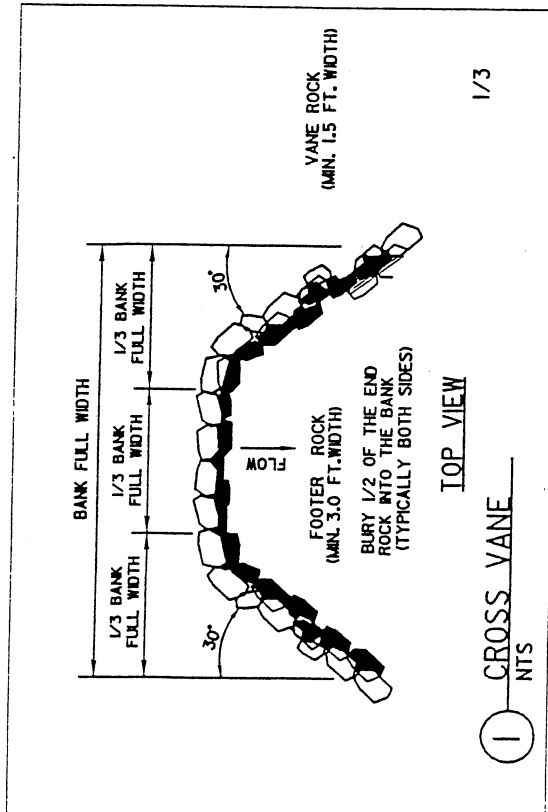
SECTION A-A



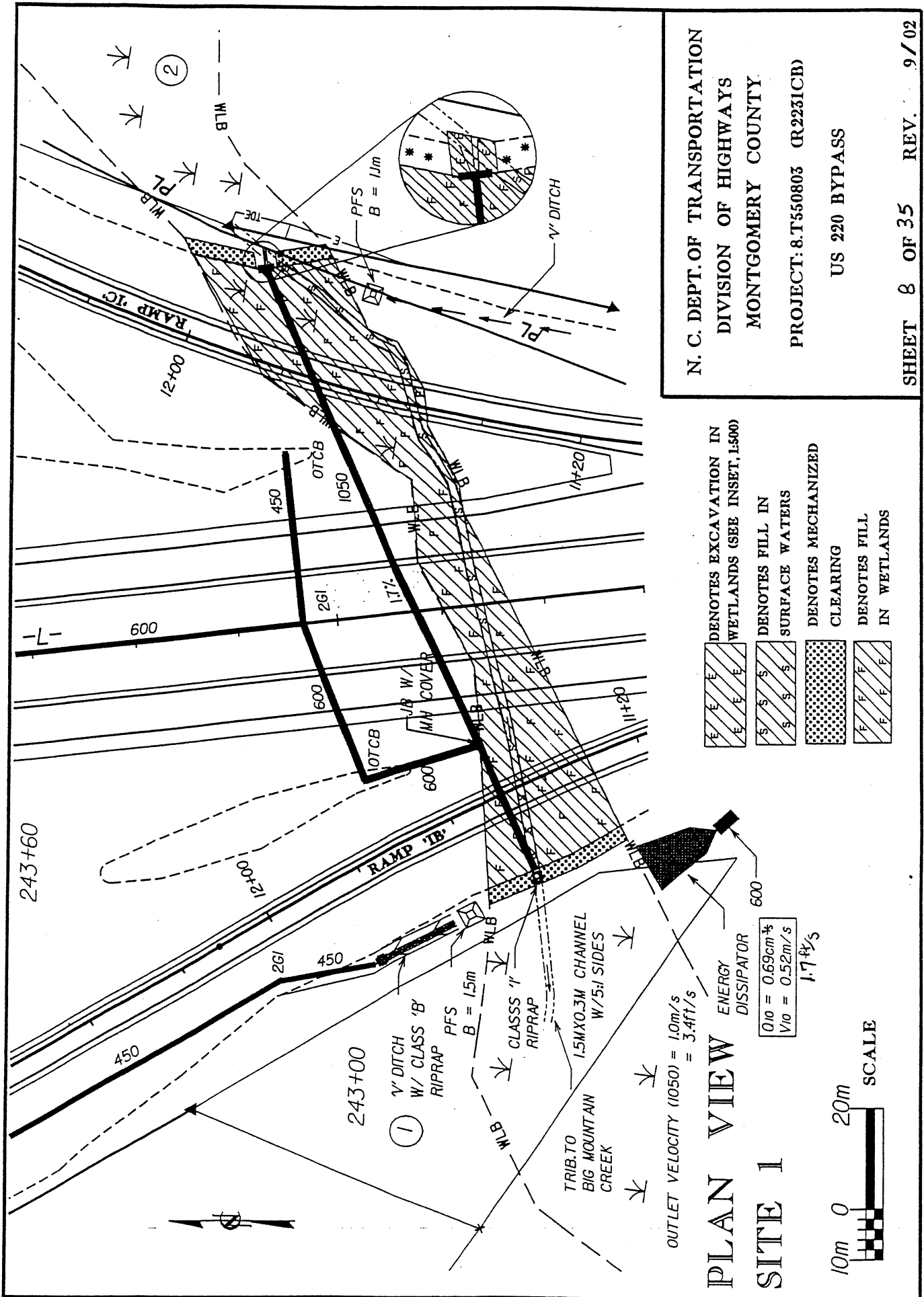
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.T550803 (R-2231CB)
US 220 BYPASS

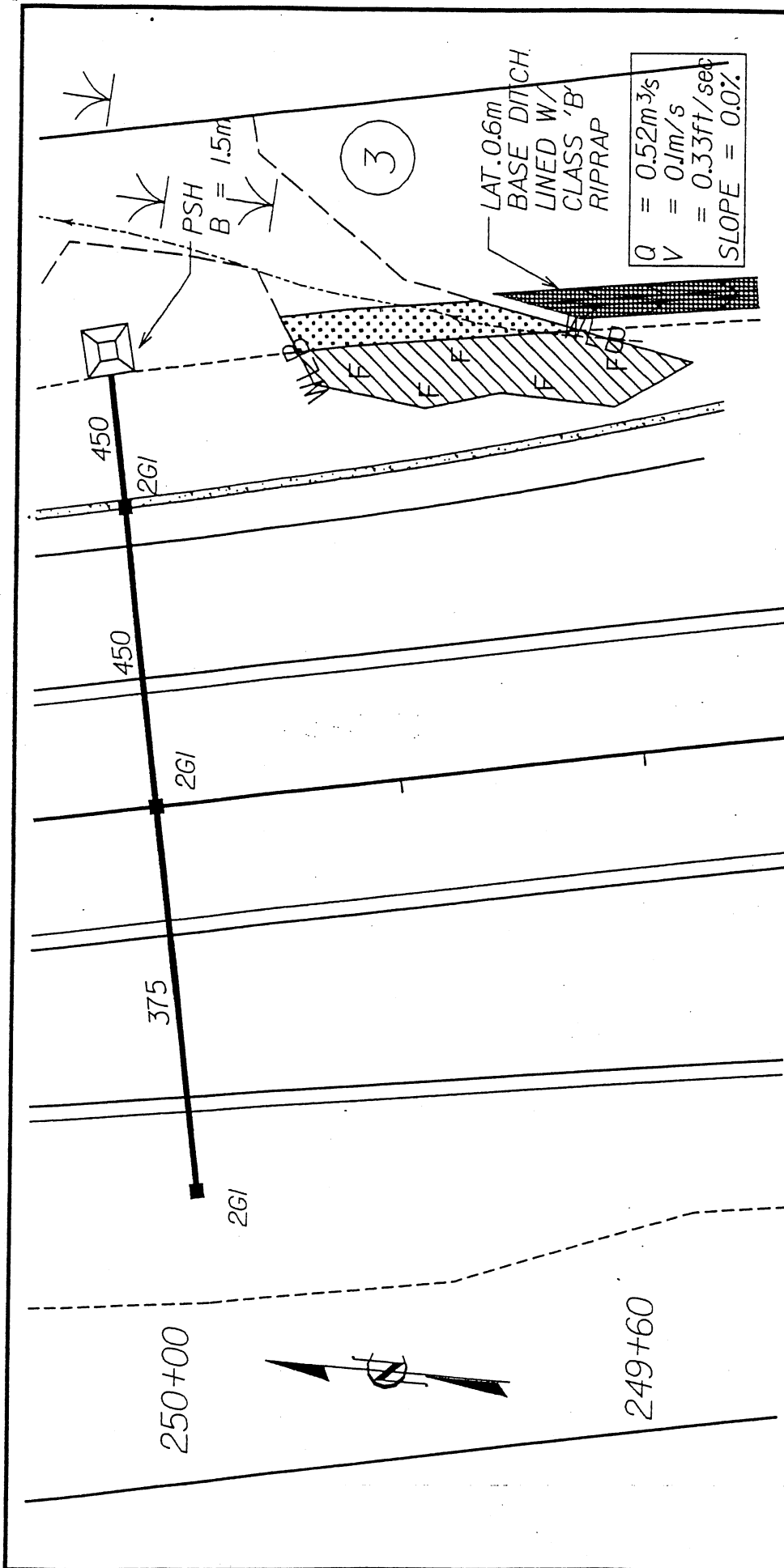
9/02

CROSS VANE DETAILS




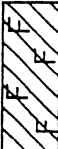
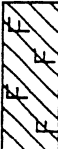
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DIVISION OF HIGHWAYS
MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CB)
US 220 BYPASS





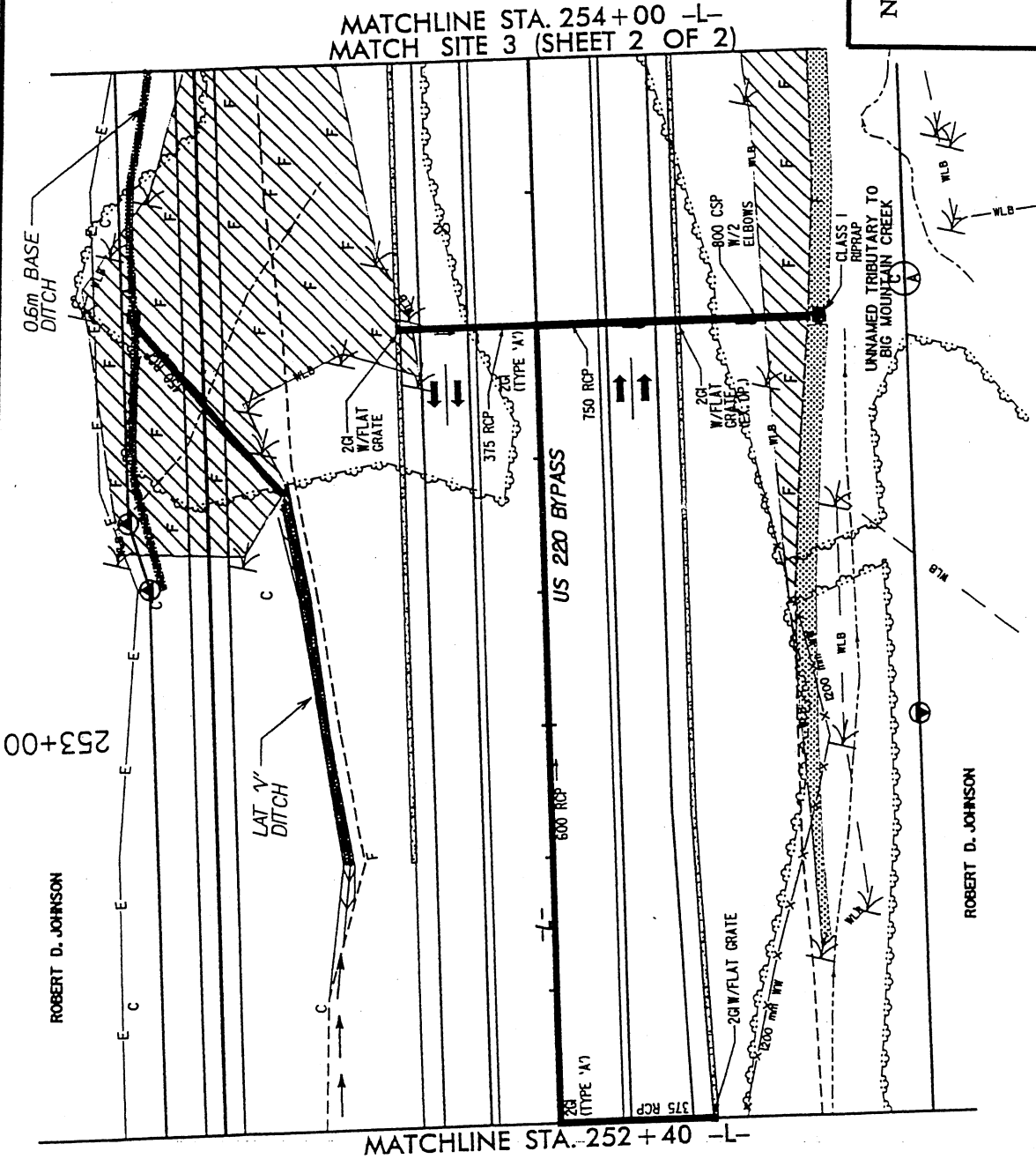
PLAN VIEW
SITE 2



 DENOTES TEMP.
 MECHANIZED CLEARING
 DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MONTGOMERY COUNTY
 PROJECT: 8.T550803 (R2231CB)
 US 220 BYPASS

PLAN VIEW SITE 3 (SHEET 1 OF 2)

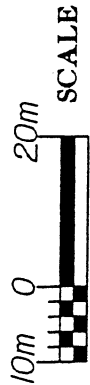


- DENOTES MECHANIZED CLEARING
- DENOTES EXCAVATION IN SURFACE WATERS
- DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS

SHEET 10 OF 35 REVISED 9 / 02



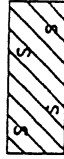
ROBERT D. JOHNSON

ROBERT D. JOHNSON

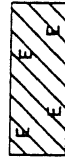
PLAN VIEW SITE 3 (SHEET 2 OF 2)



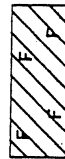
DENOTES MECHANIZED
CLEARING



DENOTES FILL
IN SURFACE WATERS

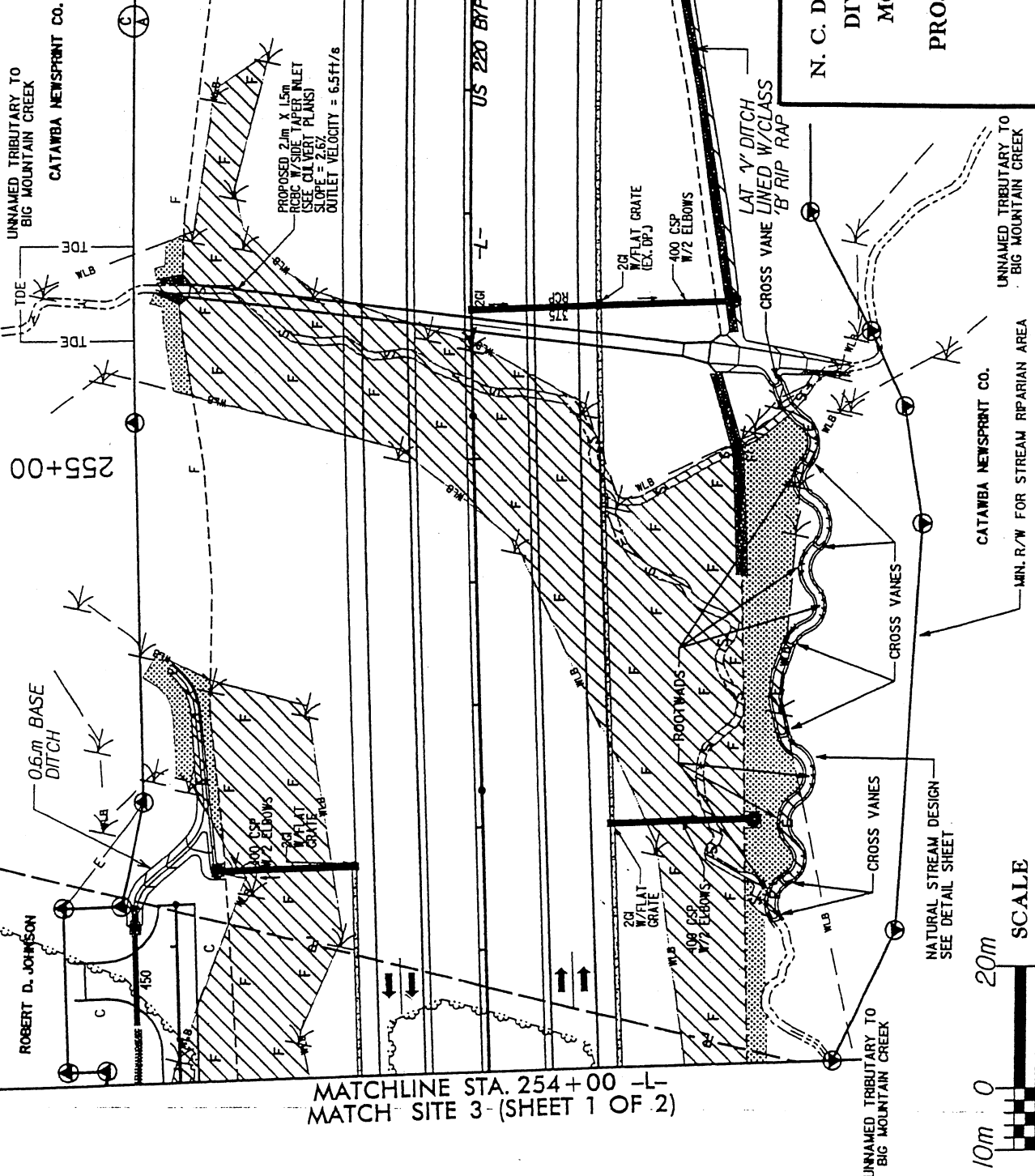


DENOTES EXCAVATION
IN WETLANDS



DENOTES FILL
IN WETLANDS

MATCHLINE STA. 255 + 80 -L-



MATCHLINE STA. 254 + 00 -L-
MATCH SITE 3 - (SHEET 1 OF 2)

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

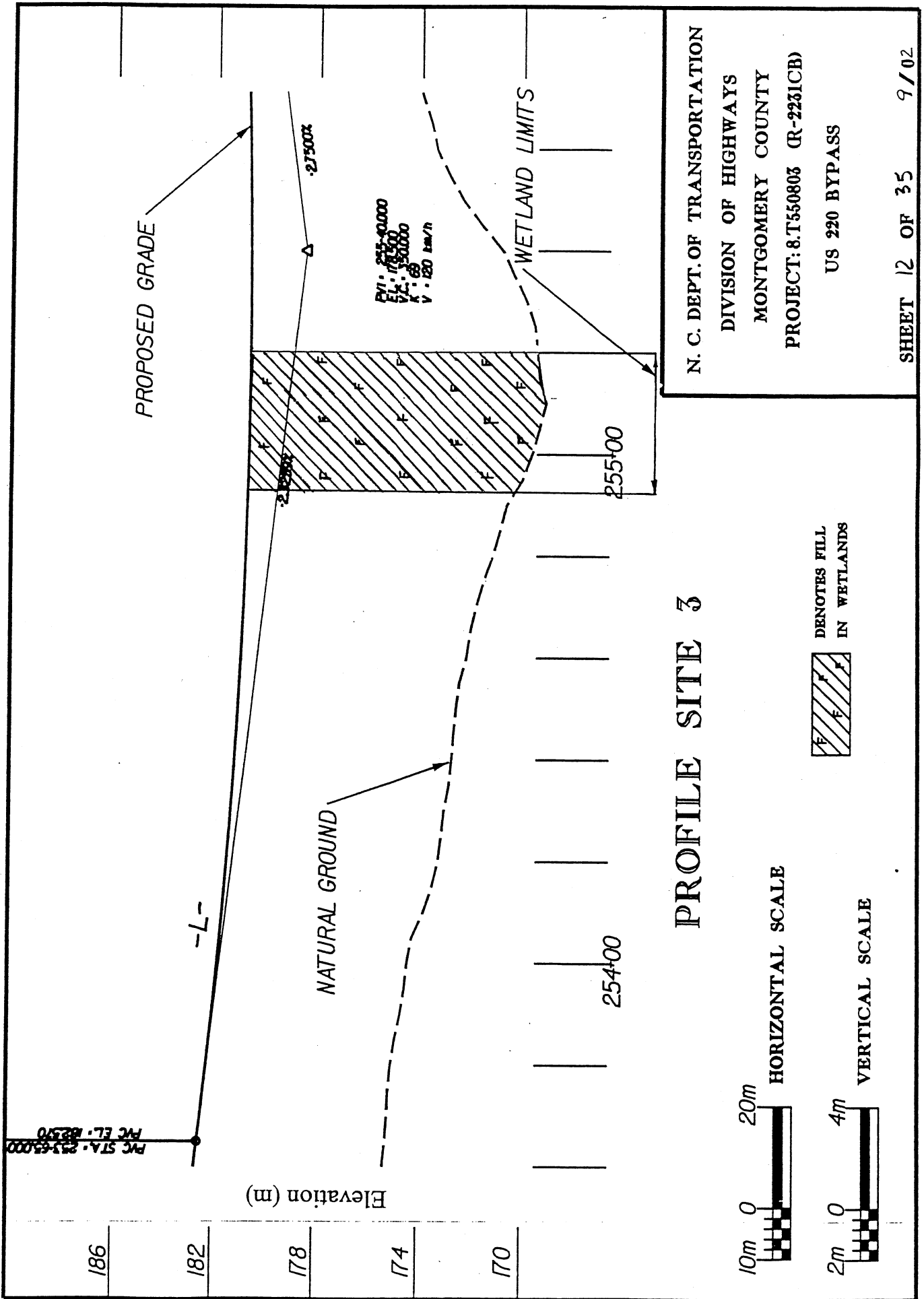
PROJECT: 8.T550803 (R-2231CB)

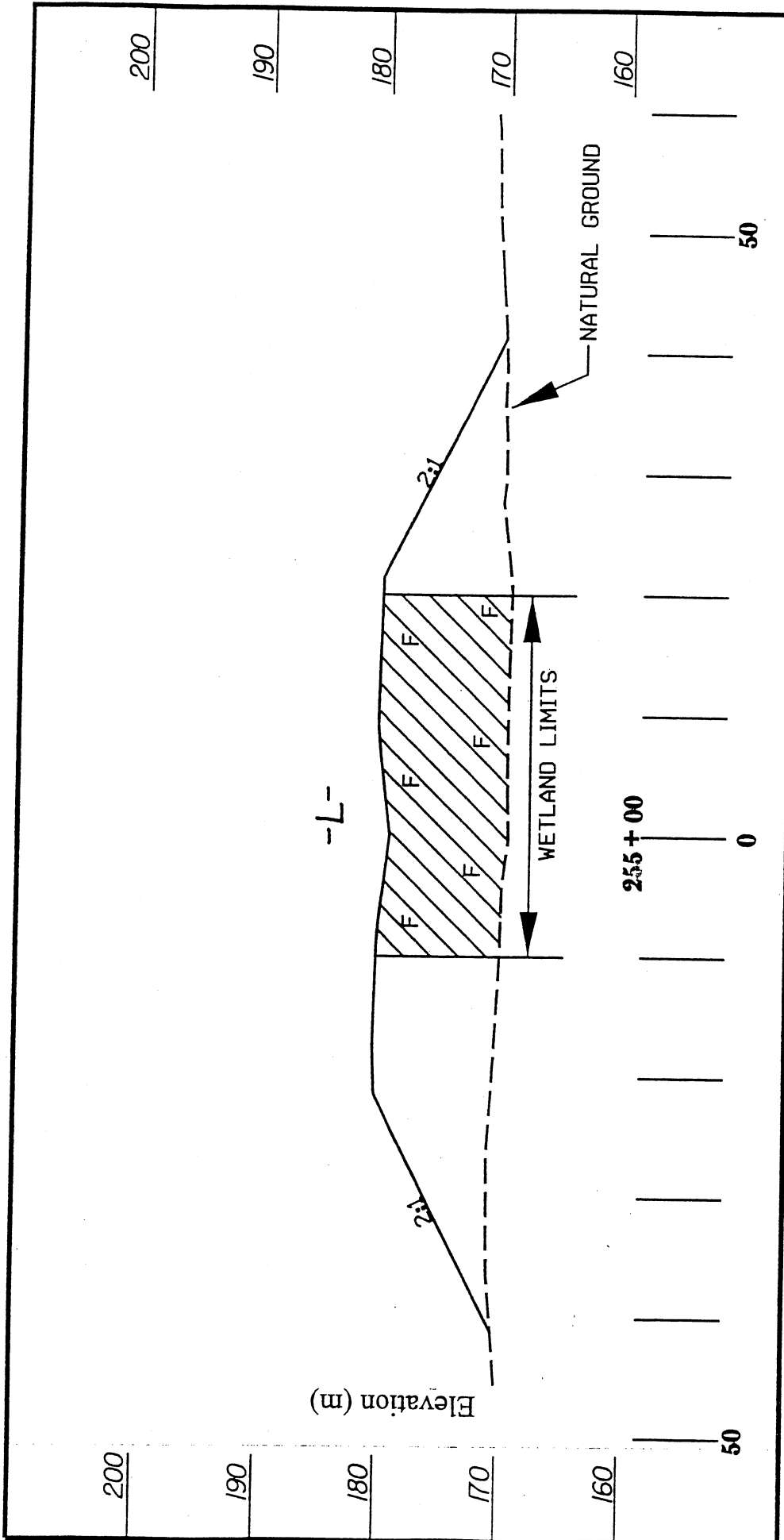
US 220 BYPASS

10m 0 20m

SCALE

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SITE 3 CROSS SECTION

N. C. DEPT. OF TRANSPORTATION

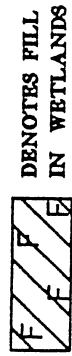
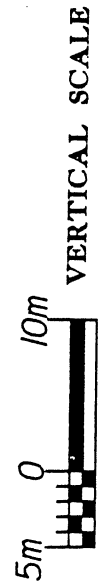
DIVISION OF HIGHWAYS

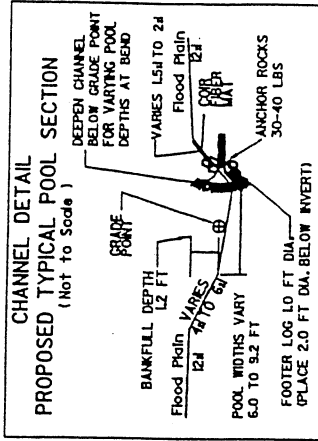
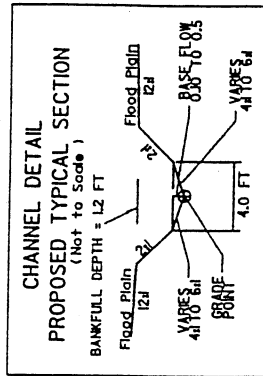
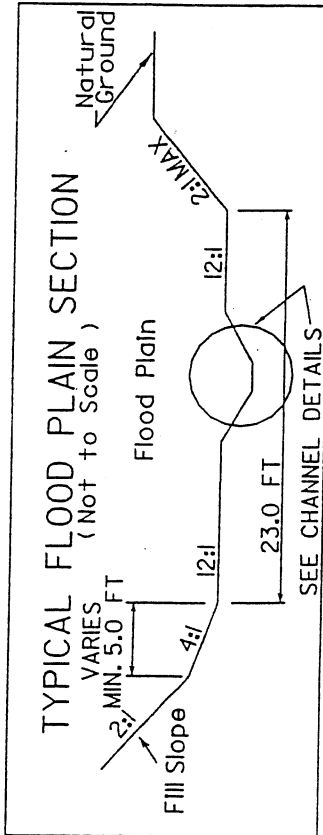
MONTGOMERY COUNTY

PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS

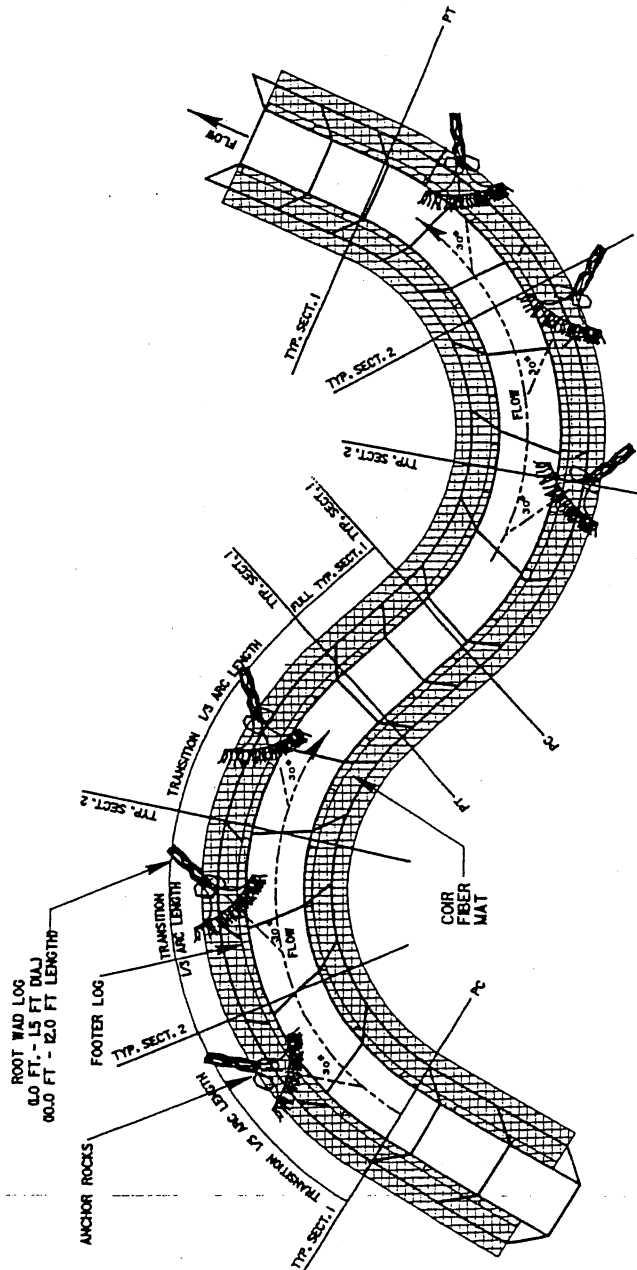
SHEET 13 OF 35 9/02





TYPICAL SECTION 2 AT BENDS

TYPICAL SECTION 1 BETWEEN BENDS



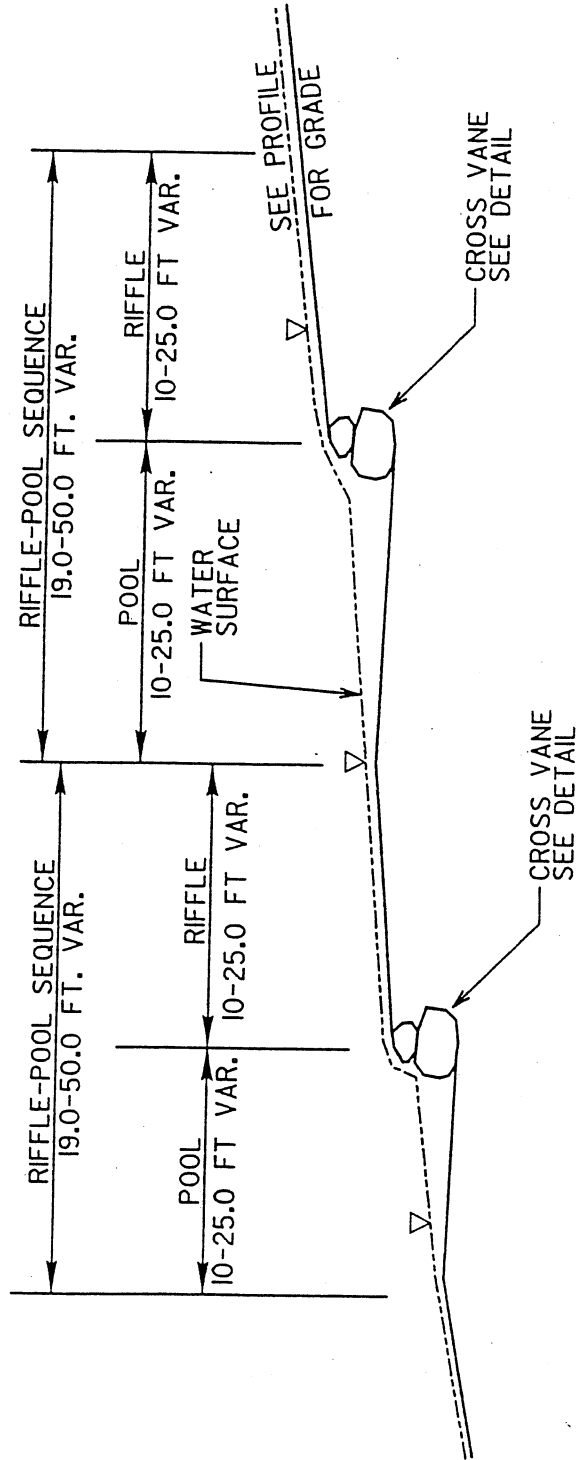
CHANNEL PLAN VIEW SITE 3

NOTES:
NUMBER OF ROOTWADS INSTALLED TO BE DETERMINED ON SITE
ROOTWADS TO BE SPACED 4x DIAMETER OF ROOT BASE
FOOTER LOG ANCHOR ROCK TO BE PLACED ON THE DOWNSTREAM END
OF EACH FOOTER LOG SO THAT IT IS LEANING AGAINST THE LOG ON
THE SIDE AWAY FROM THE CHANNEL.
WHEN BACKFILLING OVER AND AROUND FOOTER LOGS, ROOTWAD LOGS
AND ANCHOR ROCKS FIRMLY SECURE ALL COMPONENTS INCLUDING
JOINTS, CONNECTIONS AND GAPS.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS



RIFFLE-POOL SPACING SITE 3

NOT TO SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS

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Morphological Measurement Table for R-2231CB
Stream @ Site 3

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach Existing Stream
1. Stream type(Rosgen Classification)	E5	E5	na	E5
2. Drainage area (Ac)	109	109	na	109
3. Bankfull width (FT)	6.9	7.5	na	6.9
4. Bankfull mean depth (FT)	0.65	0.65	na	0.65
5. Width/depth ratio	10.5	11.5	na	10.5
6. Bankfull cross-sectional area (FT^3)	14.8	15.9	na	14.8
7. Bankfull mean velocity (FT/s)	3.3	3.3	na	3.3
8. Bankfull discharge, cfs	12.4	12.4	na	12.4
9. Bankfull max depth (riffle)	1.2	1.2	na	1.2
10. Width of floodprone area (FT)	25	24	na	25
11. Entrenchment ratio	3.6	3.2	na	3.6
12. Meander length (FT)	52	44	na	52
13. Ratio of meander length to bankfull width	7.6	5.9	na	7.6
14. Radius of curvature (FT)	13	15.4	na	13
15. Ratio of radius of curvature to bankfull width	1.9	2.05	na	1.9
16. Belt width (FT)	11.5	11.5	na	11.5
17. Meander width ratio	1.67	1.52	na	1.7
18. Sinuosity (stream length/valley length)	1.23	1.25	na	1.2
19. Valley slope (FT/FT)	0.0122	0.0122	na	0.0122
20. Average slope valley slope/sinuosity	0.0099	0.0098	na	0.0099
21. Pool slope (FT/FT)	0.005	0.005	na	0.005
22. Ratio of pool slope to average slope	0.54	0.54	na	0.54
23. Maximum pool depth (FT)	2.2	2.2	na	2.2
24. Ratio of pool depth to average bankfull depth	3.3	3.3	na	3.3
25. Pool width(FT)	6.2-8.2	6.2-9.2	na	6.2-8.2
26. Ratio of pool width to bankfull width	0.9-1.19	0.83-1.22	na	0.9-1.2
27. Pool to pool spacing (FT)	6-15	6-18	na	15-Jun
28. Ratio of pool to pool spacing to bankfull width	2.85-7.1	2.6-7.8	na	2.85-7.1

NCDOT Project ID# R-2231CB
Montgomery County
US 220 Bypass from south of SR 1524 to
Existing four-lane section of US 220, North of US 220 alternate

Prepared by: Sungate Design Group, PA
915-A Jones Franklin Road
Raleigh, NC 27606

April 13, 2001

NATURAL CHANNEL DESIGN
RIGHT OF STA. 254+60 -L-

The proposed new location US 220 will cause a shift in the existing stream at +/- 254+60 -L-. The existing and proposed channels were classified according to principles proposed by Dave Rosgen.

The existing stream drains 44 Ha (109 Acres) of a rural agricultural area. The first order perennial stream drains an existing pastureland into a hardwood forest at the point of relocation. The channel was found to be perennial with riffles, pools, and aquatic wildlife.

There are no hydraulic gage data available on this stream nor on nearby streams. Current discharges were estimated using NCDOT procedures for rural watersheds and calibrated to the field observed bankfull depth.

The existing channel is relatively stable in the hardwood forest and has pattern and dimension. The data gathered was used to classify the reach to be relocated as an E5 stream according to the Rosgen classification procedure.

Because of the development in the present climatic era, a reference reach of a **stable** stream in this area is unlikely. A portion upstream of the site and at the site was used as a representative reach to reference pattern and dimension. The portion used for a reference was found to have characteristics of an E5 stream. The dimensions gathered in the field compared favorably to the regional curves developed by the North Carolina Stream Restoration Institute. Using these reference characteristics and the regional curves Sungate Design has recommended a natural stream design by replacing the existing E5 channel with a stable E5 channel.

Bankfull mean depth was found to be 0.2m (0.7 ft). With this information a proposed channel was designed to maintain a low width/depth ratio and a high entrenchment ratio. Sinuosity was increased slightly, as well as, the radius of curvature. These modifications will encourage a decrease of energy along the channel banks.

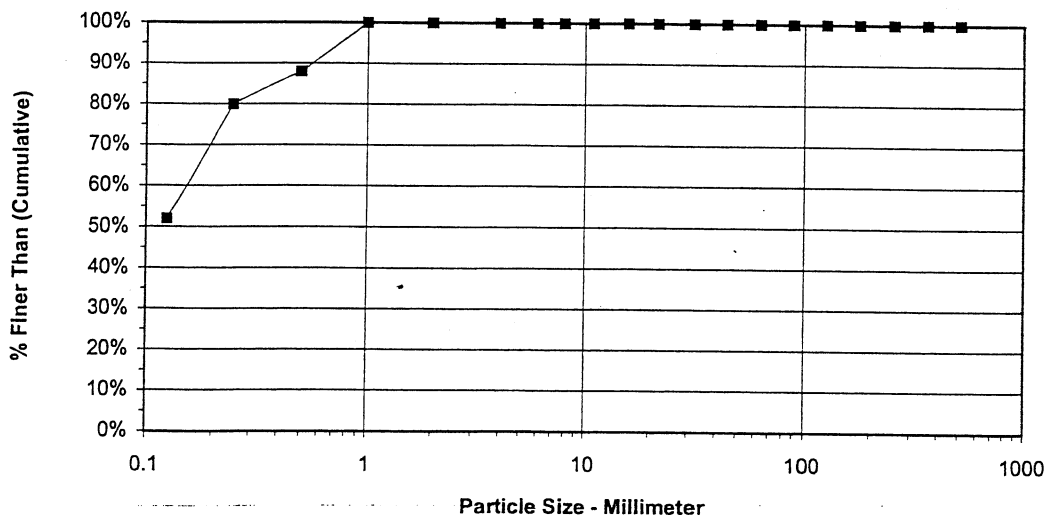
A pebble count was conducted in the pools and riffles. Velocities were obtained using standard engineering procedures. These velocities were compared to shear stresses predicted by the pebble count. The pebble count confirmed the channel hydraulics by qualifying the velocities that have moved bed form material. This material has been classified as a fine to medium sand. The proposed channel was designed to maintain velocities and appropriate shear stress that will transport this type of material at bankfull stage without aggrading or degrading the stream banks or bed.

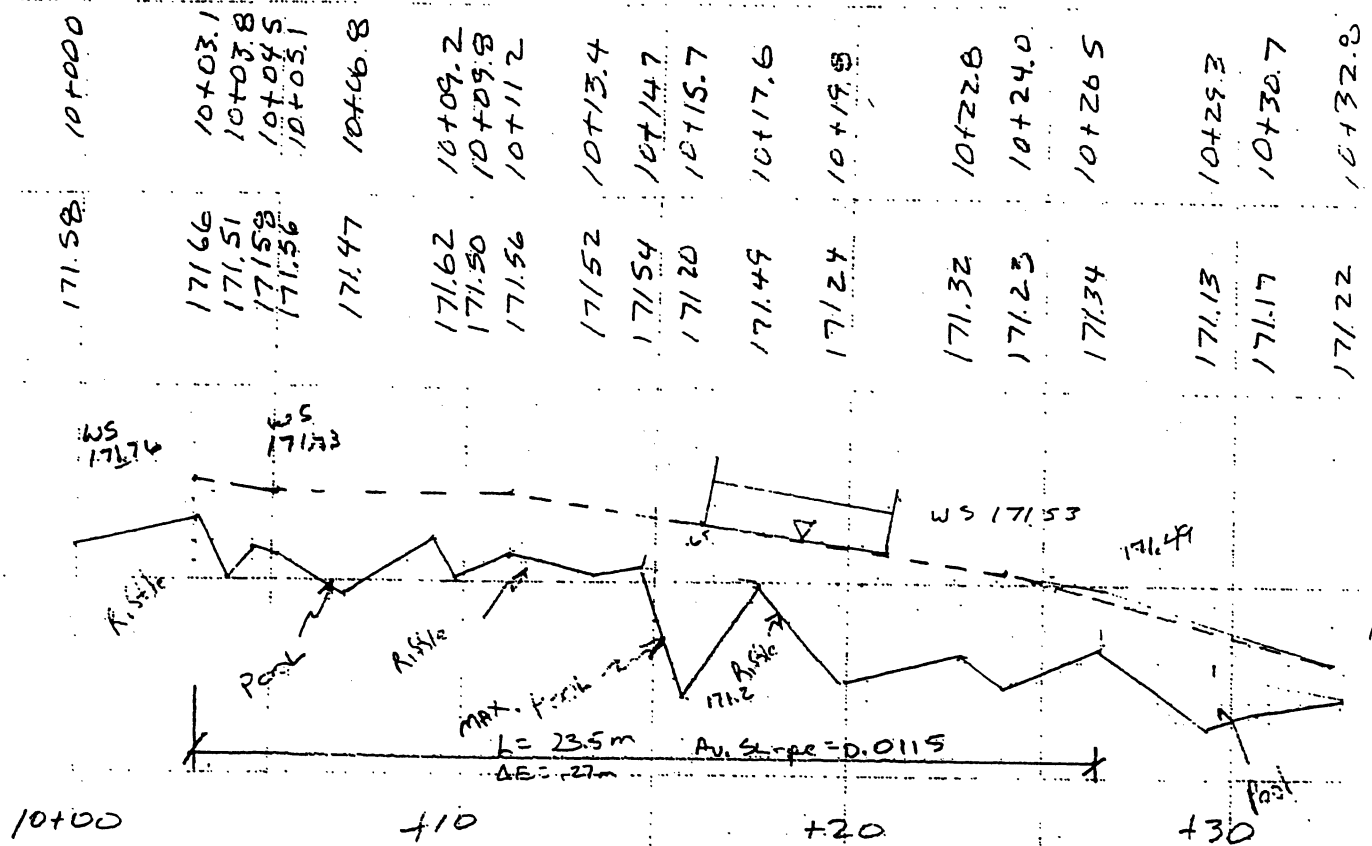
The proposed channel utilizes cross vanes and root wads to direct flow away from the banks and help create pools and riffles to encouraged aquatic habitat. Finally, native woody vegetation will be used to stabilize the proposed flood plain and channel banks.

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PEBBLE COUNT								
Site: Trib. To Big Mountain Crk. +/-254+60-L- R-2231CB						Date: 4-05-01		
Party: WHW,FFF,RHK								
Particle Counts								
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C	16	0	16	16%	16%
.04 - .08	Very Fine	.062 - .125	S	36	0	36	36%	52%
	Fine	.125 - .25	A	28	0	28	28%	80%
	Medium	.25 - .50	N	8	0	8	8%	88%
	Coarse	.50 - 1.0	D	12	0	12	12%	100%
	Very Coarse	1.0 - 2.0	S	0	0	0	0%	100%
.08 - .16	Very Fine	2.0 - 4.0		0	0	0	0%	100%
.16 - .22	Fine	4.0 - 5.7	G	0	0	0	0%	100%
.22 - .31	Fine	5.7 - 8.0	R	0	0	0	0%	100%
.31 - .44	Medium	8.0 - 11.3	A	0	0	0	0%	100%
.44 - .63	Medium	11.3 - 16.0	V	0	0	0	0%	100%
.63 - .89	Coarse	16.0 - 22.6	E	0	0	0	0%	100%
.89 - 1.26	Coarse	22.6 - 32.0	L	0	0	0	0%	100%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S	0	0	0	0%	100%
1.77 - 2.5	Very Coarse	45.0 - 64.0		0	0	0	0%	100%
2.5 - 3.5	Small	64 - 90	C	0	0	0	0%	100%
3.5 - 5.0	Small	90 - 128	O	0	0	0	0%	100%
5.0 - 7.1	Large	128 - 180	B	0	0	0	0%	100%
7.1 - 10.1	Large	180 - 256	L	0	0	0	0%	100%
10.1 - 14.3	Small	256 - 362	B	0	0	0	0%	100%
14.3 - 20	Small	362 - 512	L	0	0	0	0%	100%
20 - 40	Medium	512 - 1024	D	0	0	0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R	0	0	0	0%	100%
	Bedrock		BDRK	0	0	0	0%	100%
Totals				100	0	100	100%	100%

Particle Size Distribution



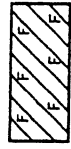


Existing (Thalweg) THAL PROFILE NEAR PBL # 74
(Reference)

± 254 +60 -L- LT.

PLAN VIEW SITE 5

DENOTES FILL IN WETLANDS



DENOTES FILL IN SURFACE WATERS



DENOTES MECHANIZED CLEARING

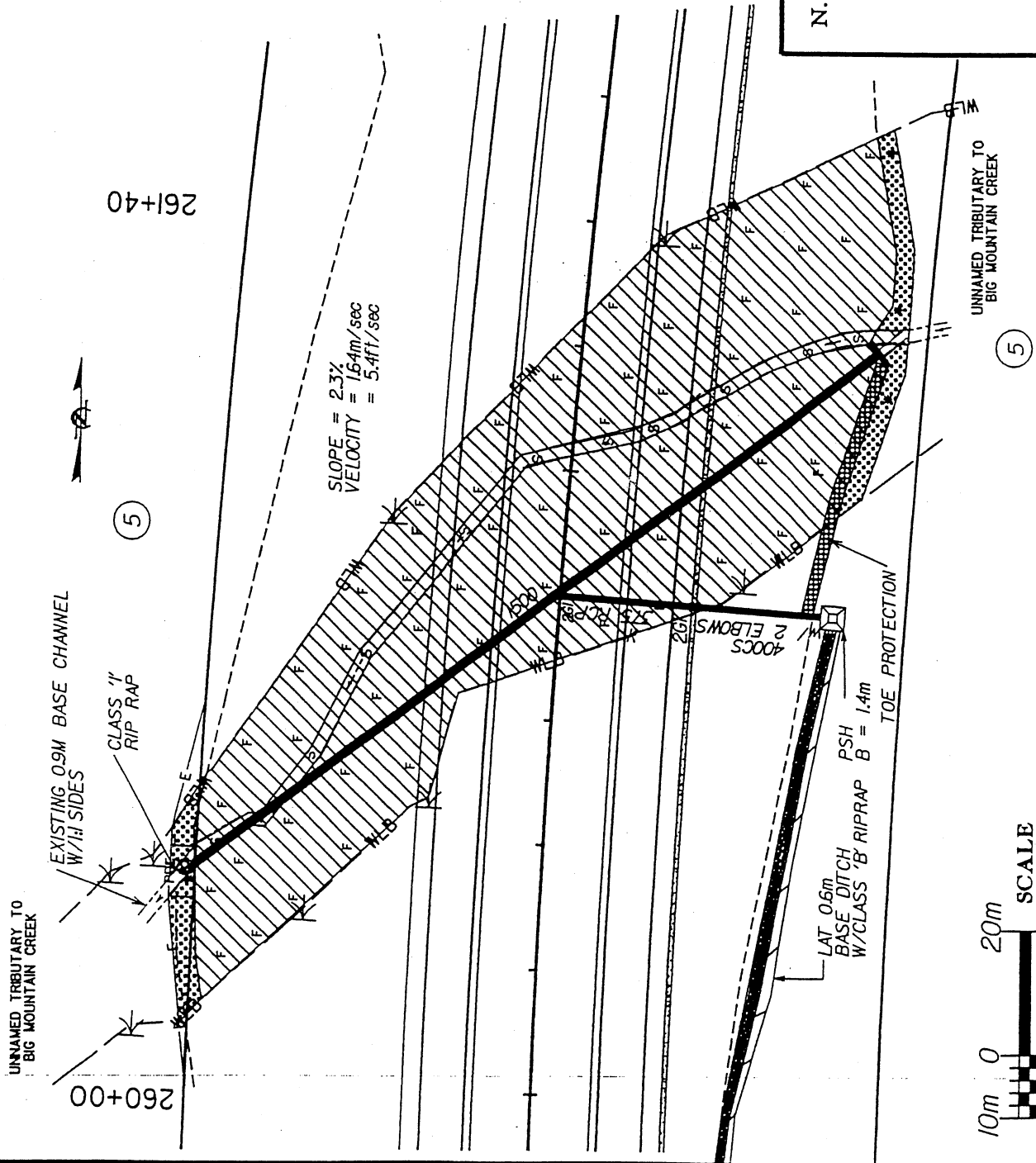


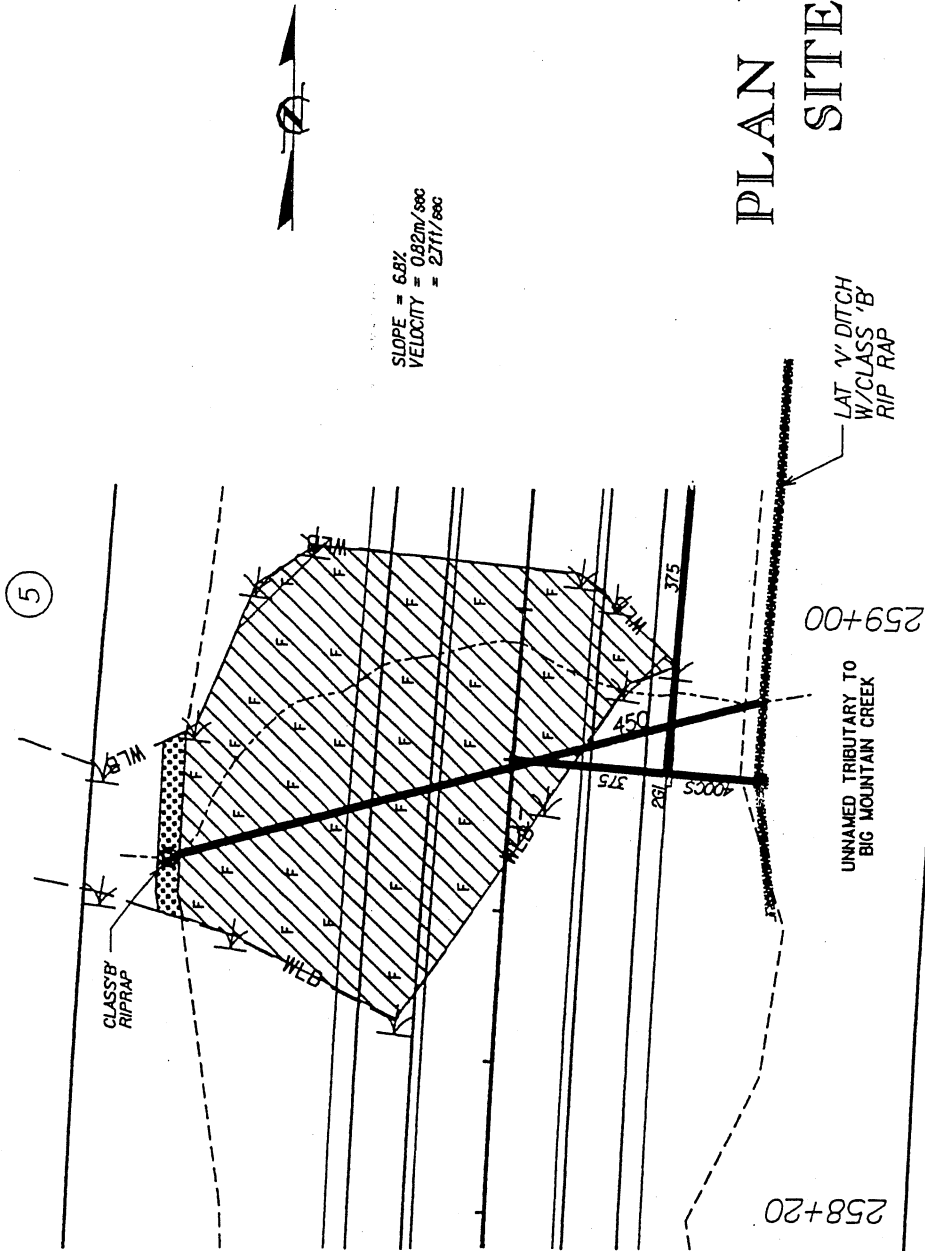
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

PROJECT: 8.T550803 (R2231CB)

US220 BYPASS

SHEET 22 OF 35 REV 9/02





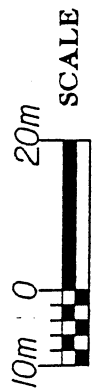
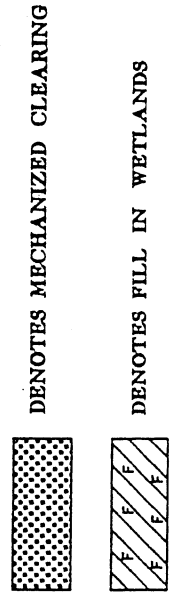
PLAN VIEW
SITE 4

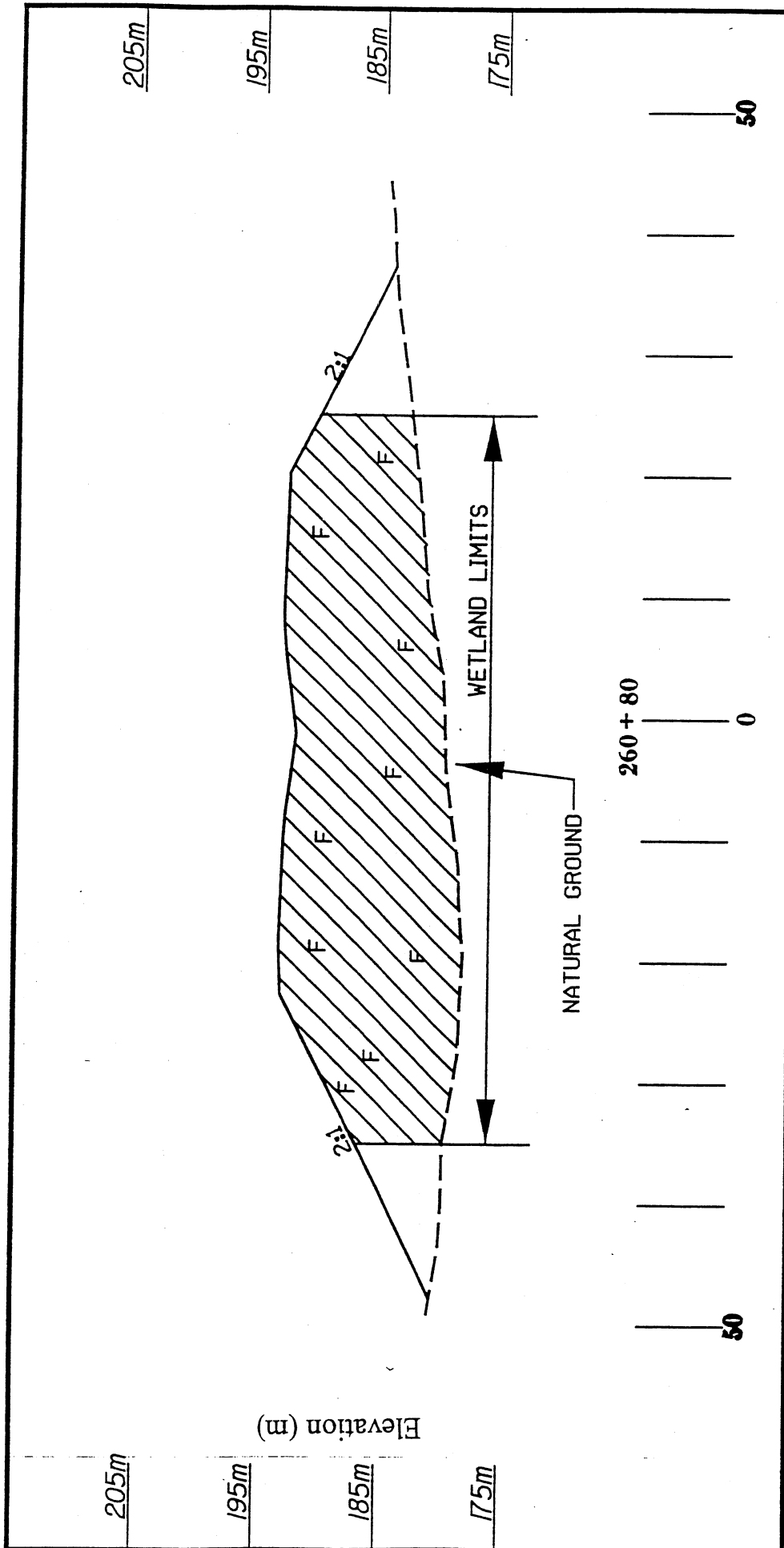
**N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY**

PROJECT: 8.T550803 (R2231CB)

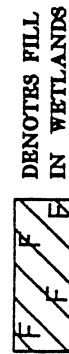
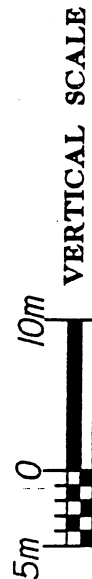
US 220 BYPASS

SHEET 21 OF 35 REV. 9/02

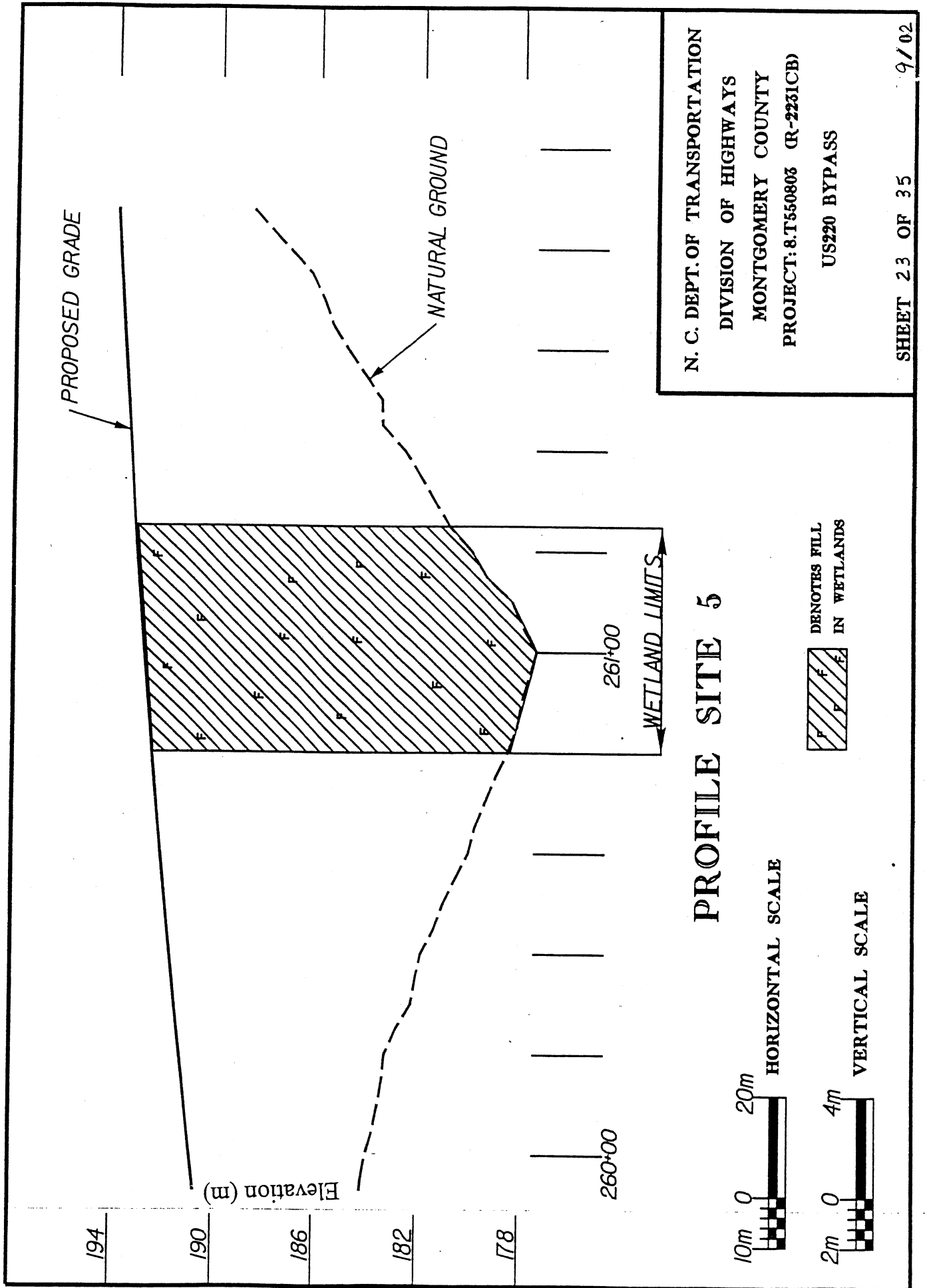


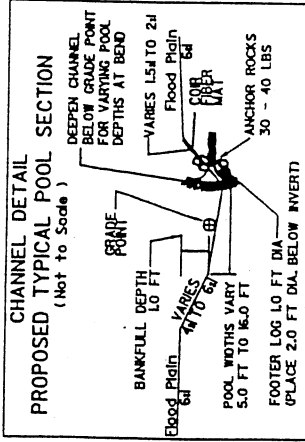
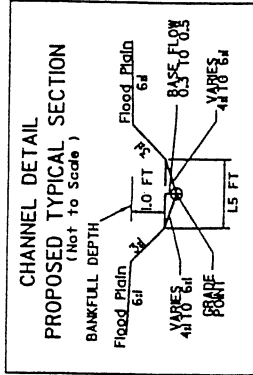
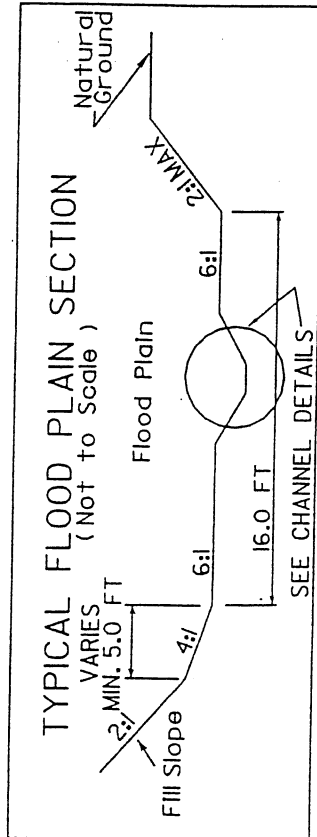


SITE 5 CROSS SECTION

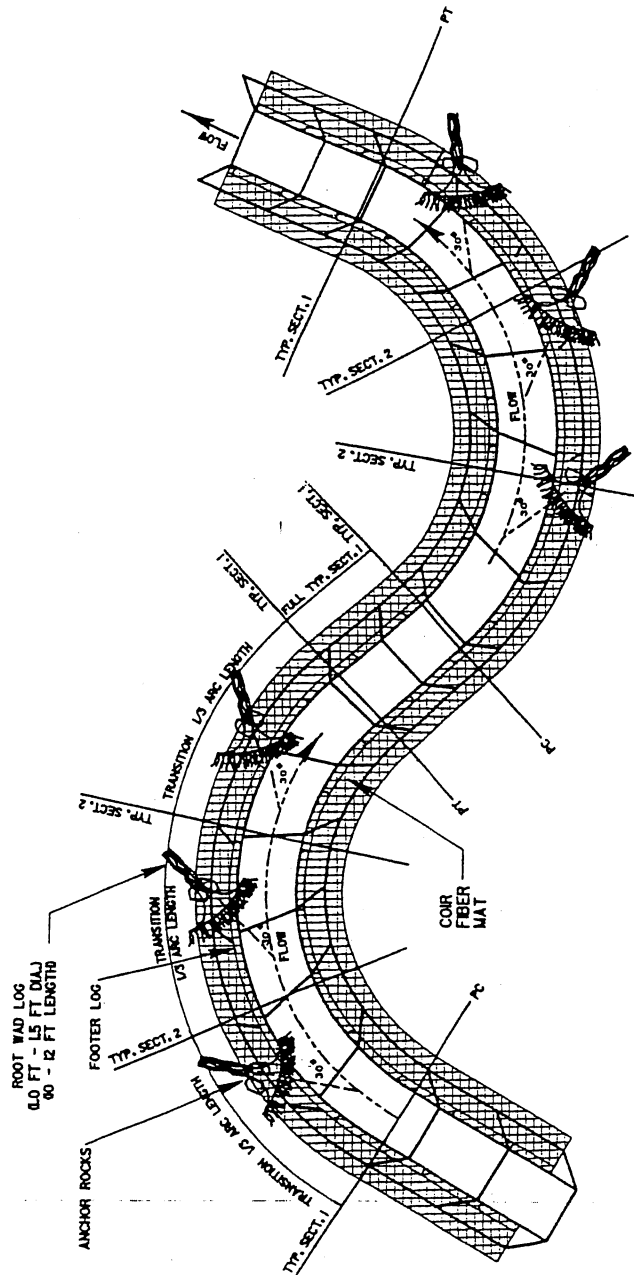


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY
PROJECT: 8.T550803 (R-2231CB)
US 220 BYPASS





TYPICAL SECTION 2 AT BENDS

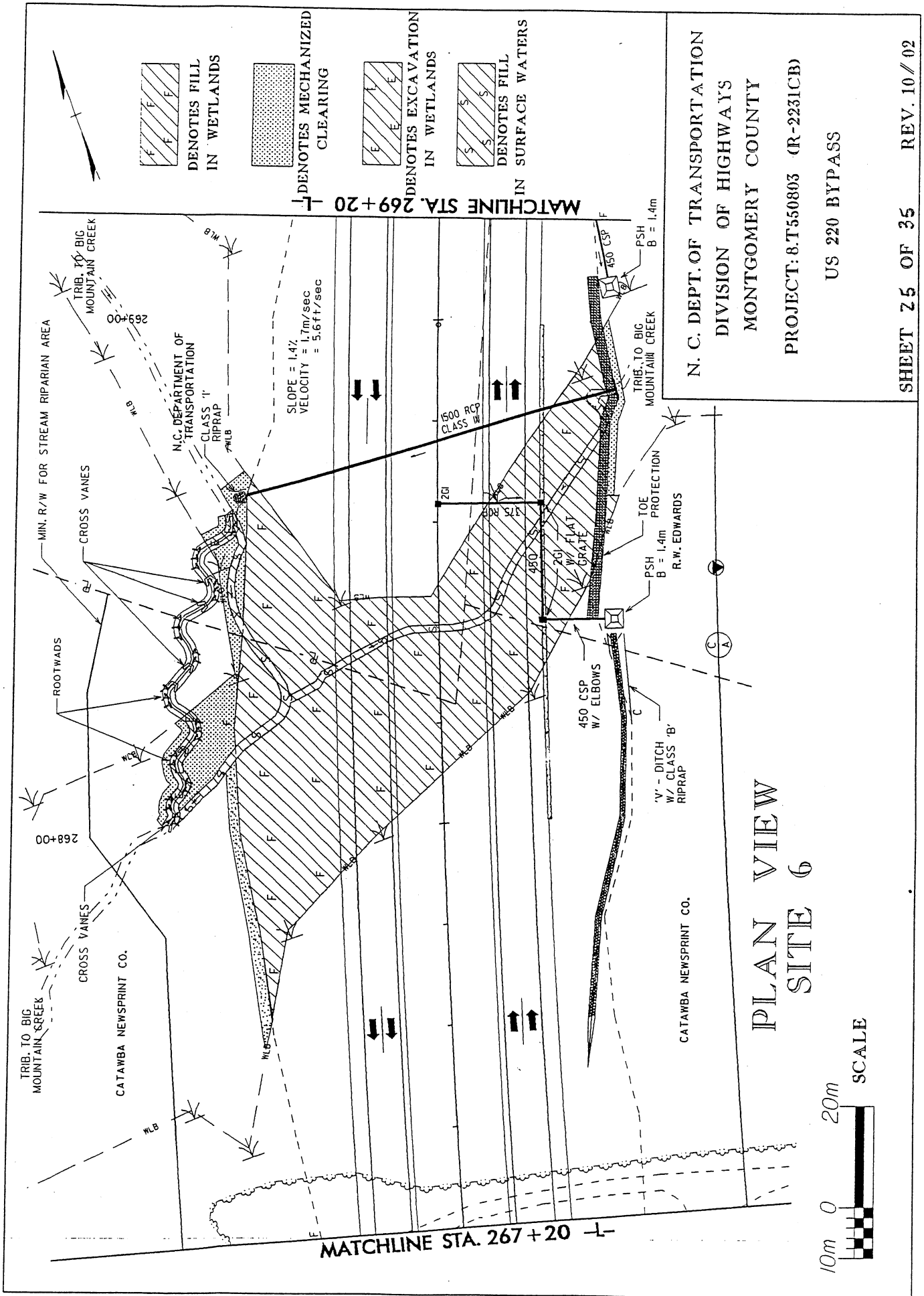


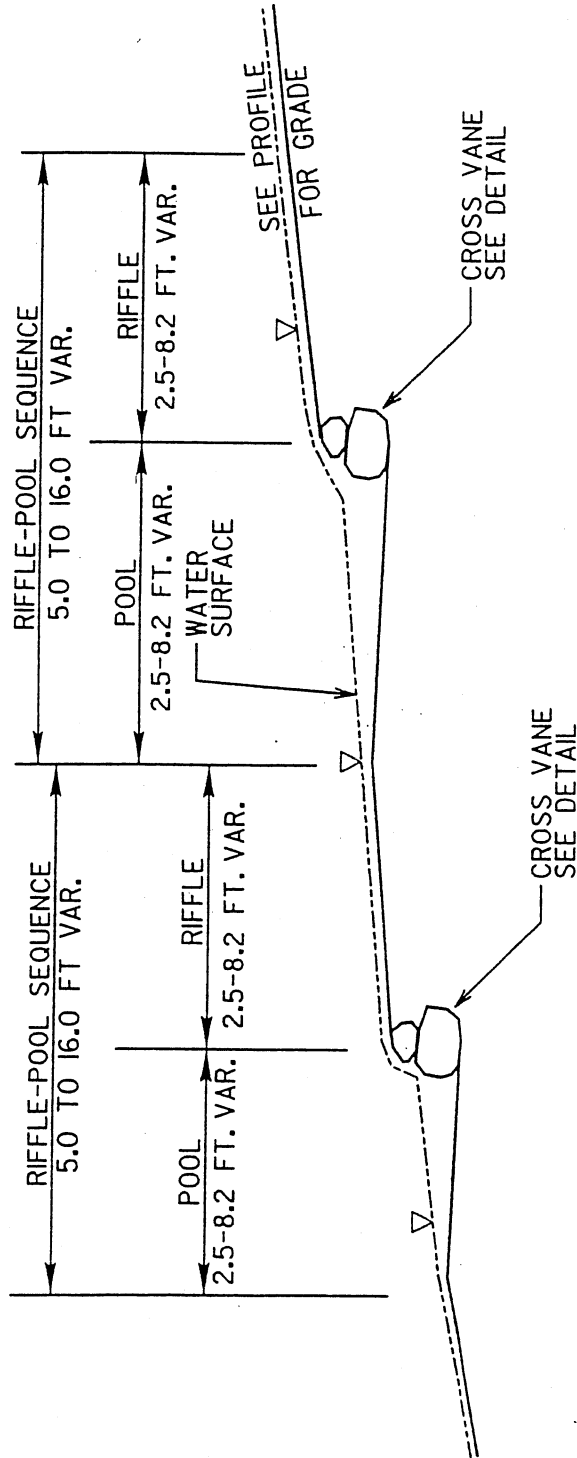
NOTES:
NUMBER OF ROOTWADS INSTALLED TO BE DETERMINED ON SITE
ROOTWADS TO BE SPACED 4X DIAMETER OF ROOT BASE
FOOTER LOG ANCHOR ROCK TO BE PLACED ON THE DOWNSTREAM END OF EACH FOOTER LOG SO THAT IT IS LEANING AGAINST THE LOG ON THE SIDE AWAY FROM THE CHANNEL.
WHEN BACKFILLING OVER AND AROUND FOOTER LOGS, ROOTWAD LOGS AND ANCHOR ROCKS FIRMLY SECURE ALL COMPONENTS INCLUDING JOINTS, CONNECTIONS AND GAPS.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS





RIFFLE-POOL SPACING SITE 6

NOT TO SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MONTGOMERY COUNTY

PROJECT: 8.T550803 (R-2231CB)

US 220 BYPASS

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Morphological Measurement Table for R-2231CB

Stream @ Site 6

Variables	Existing Channel	Proposed Reach	USGS Station	Reference Reach Stream @ Site #3
1. Stream type(Rosgen Classification)	E5	E5	na	E5
2. Drainage area (Ac)	74	74	na	109
3. Bankfull width (FT)	5.9	6.5	na	6.9
4. Bankfull mean depth (FT)	0.69	0.6	na	0.65
5. Width/depth ratio	8.6	10.8	na	10.5
6. Bankfull cross-sectional area (FT^3)	13.1	13.4	na	14.8
7. Bankfull mean velocity (FT/s)	2.8	2.8	na	3.3
8. Bankfull discharge, cfs	11	11.3	na	12.4
9. Bankfull max depth (riffle)	1	1	na	1.2
10. Width of floodprone area (FT)	13.8	16.4	na	25
11. Entrenchment ratio	2.3	2.4	na	3.6
12. Meander length (FT)	28	44	na	52
13. Ratio of meander length to bankfull width	4.7	6.8	na	7.6
14. Radius of curvature (FT)	8.2	10	na	13
15. Ratio of radius of curvature to bankfull width	1.35	1.5	na	1.9
16. Belt width (FT)	9.8	11	na	11.5
17. Meander width ratio	1.7	1.7	na	1.7
18. Sinuosity (stream length/valley length)	1.4	1.4	na	1.2
19. Valley slope (FT/FT)	0.0125	0.0125	na	0.0122
20. Average slope valley slope/sinuosity	0.0086	0.0096	na	0.0099
21. Pool slope (FT/FT)	0.005	0.005	na	0.005
22. Ratio of pool slope to average slope	0.58	0.52	na	0.54
23. Maximum pool depth (FT)	1.3	1.3	na	2.2
24. Ratio of pool depth to average bankfull depth	1.9	2.2	na	3.3
25. Pool width(FT)	3.9-10.2	4.9-10.2	na	6.2-8.2
26. Ratio of pool width to bankfull width	0.67-1.7	0.75-1.6	na	0.9-1.2
27. Pool to pool spacing (FT)	3.6-14.8	4.9-16.4	na	15-Jun
28. Ratio of pool to pool spacing to bankfull width	0.61-2.5	0.75-2.5	na	2.85-7.1

NCDOT Project ID# R-2231CB
Montgomery County
US 220 Bypass from south of SR 1524 to
Existing four-lane section of US 220, North of US 220 alternate

Prepared by: Sungate Design Group, PA
915-A Jones Franklin Road
Raleigh, NC 27606

April 13, 2001

NATURAL CHANNEL DESIGN
RIGHT OF STA. 268+40 -L-

The proposed new location US 220 will cause a shift in the existing stream at +/- 268+40 -L-. The existing and proposed channels were classified according to principles developed by Dave Rosgen.

The existing stream drains 30 Ha (74 Acres) of a rural hardwood forested area. The first order perennial stream drains an existing hardwood forest at the point of relocation. The channel was found to be perennial with riffles, pools, and aquatic wildlife.

There are no hydraulic gage data available on this stream nor on nearby streams. Current discharges were estimated using NCDOT procedures for rural watersheds and calibrated to the field observed bankfull depth.

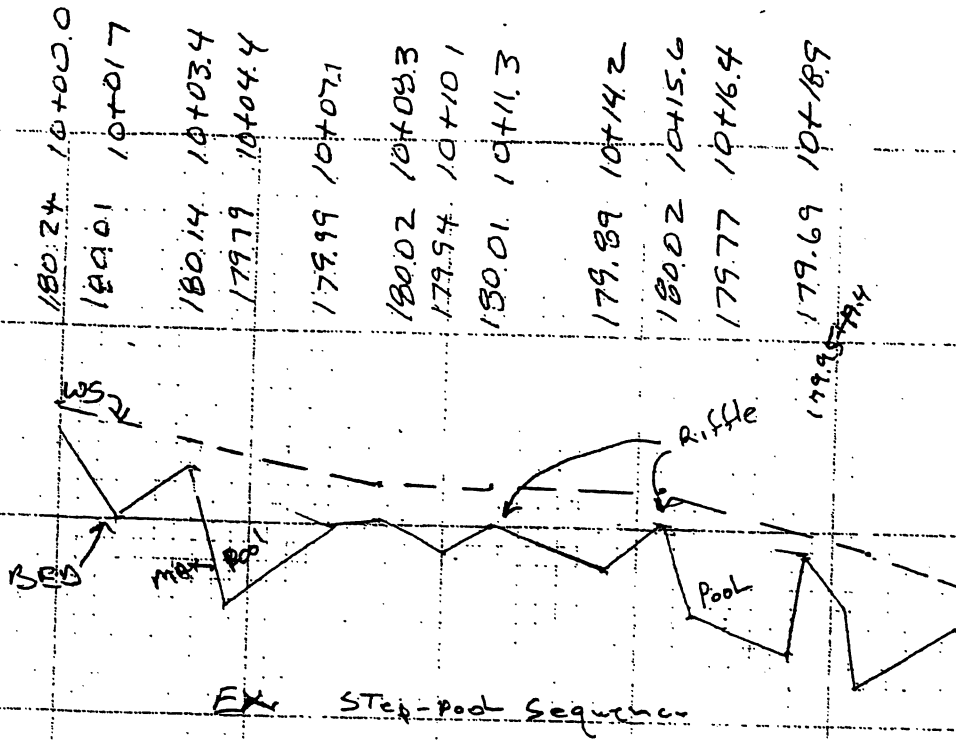
The existing channel is relatively stable in the hardwood forest and has pattern and dimension. The data gathered was used to classify the reach to be relocated as an E5 stream according to the Rosgen classification procedure.

Because of the development in the present climatic era, a reference reach of a **stable** stream in this area is unlikely. A portion of the existing stream at station 254+60 -L- was used as a representative reach to reference pattern and dimension. The portion used for a reference was found to have characteristics of an E5 stream. The dimensions gathered in the field compared favorably to the regional curves developed by the North Carolina Stream Restoration Institute. Using these reference characteristics and the regional curves Sungate Design has recommended a natural stream design by replacing the existing E5 channel with a stable E5 channel.

Bankfull mean depth was found to be 0.18m (0.6 ft). With this information a proposed channel was designed to maintain a low width/depth ratio and a high entrenchment ratio. Sinuosity was maintained with an increase in the radius of curvature. These modifications will encourage a decrease of energy along the channel banks.

A pebble count was conducted in the pools and riffles. Velocities were obtained using standard engineering procedures. These velocities were compared to shear stresses predicted by the pebble count. The pebble count confirmed the channel hydraulics by qualifying the velocities that have moved bed form material. This material has been classified as a fine to medium sand. The proposed channel was designed to maintain velocities that will transport this type of material at bankfull stage without aggrading or degrading the stream banks or bed.

The proposed channel utilizes cross vanes and root wads to direct flow away from the banks and help create pools and riffles to encouraged aquatic habitat. Finally, native woody vegetation will be used to stabilize the proposed flood plain and channel banks.



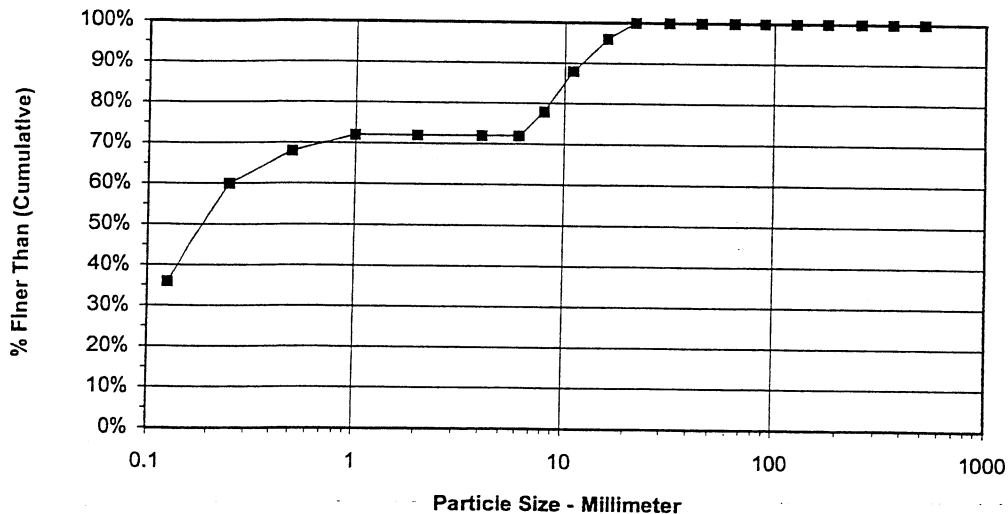
EXISTING THALWEG PROFILE

10+00 +10 +20 +30

± 268+40 RT-L-

PEBBLE COUNT								
Site: Trib. To Big Mountain Crk. +/-268+40-R2231 CB						Date: 4-05-01		
Party: WHW, FFF, RHK								
Particle Counts								
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C	12	0	12	12%	12%
.04 -.08	Very Fine	.062 - .125	S	24	0	24	24%	36%
	Fine	.125 - .25	A	24	0	24	24%	60%
	Medium	.25 - .50	N	8	0	8	8%	68%
	Coarse	.50 - 1.0	D	4	0	4	4%	72%
	Very Coarse	1.0 - 2.0	S	0	0	0	0%	72%
.08 - .16	Very Fine	2.0 - 4.0		0	0	0	0%	72%
.16 - .22	Fine	4.0 - 5.7	G	0	0	0	0%	72%
.22 - .31	Fine	5.7 - 8.0	R	6	0	6	6%	78%
.31 - .44	Medium	8.0 - 11.3	A	10	0	10	10%	88%
.44 - .63	Medium	11.3 - 16.0	V	8	0	8	8%	96%
.63 - .89	Coarse	16.0 - 22.6	E	4	0	4	4%	100%
.89 - 1.26	Coarse	22.6 - 32.0	L	0	0	0	0%	100%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S	0	0	0	0%	100%
1.77 - 2.5	Very Coarse	45.0 - 64.0		0	0	0	0%	100%
2.5 - 3.5	Small	64 - 90	C	0	0	0	0%	100%
3.5 - 5.0	Small	90 - 128	O	0	0	0	0%	100%
5.0 - 7.1	Large	128 - 180	B	0	0	0	0%	100%
7.1 - 10.1	Large	180 - 256	L	0	0	0	0%	100%
10.1 - 14.3	Small	256 - 362	B	0	0	0	0%	100%
14.3 - 20	Small	362 - 512	L	0	0	0	0%	100%
20 - 40	Medium	512 - 1024	D	0	0	0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R	0	0	0	0%	100%
	Bedrock		BDRK		0	0	0%	100%
Totals				100	0	100	100%	100%

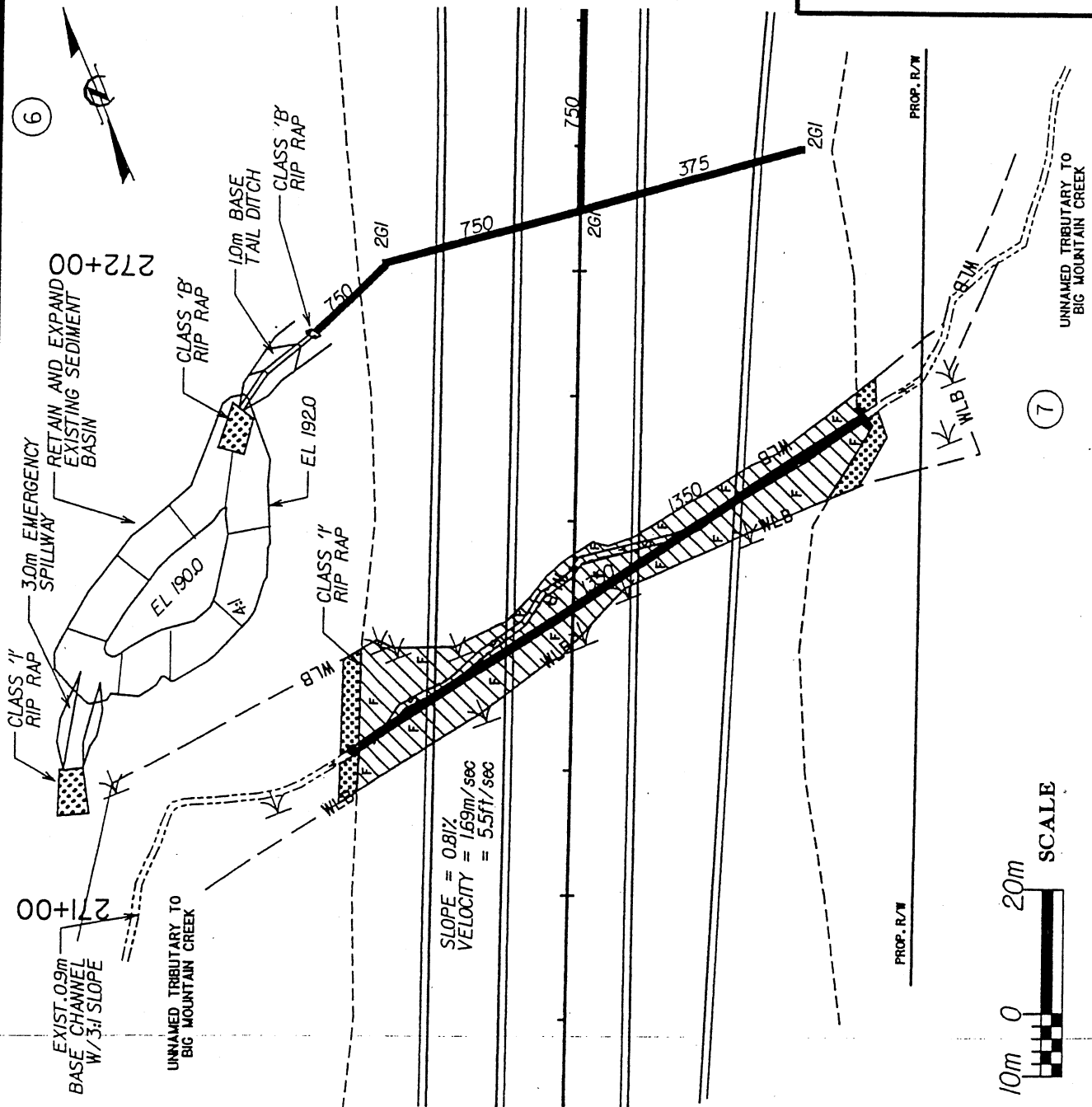
Particle Size Distribution





US 220 BYPASS

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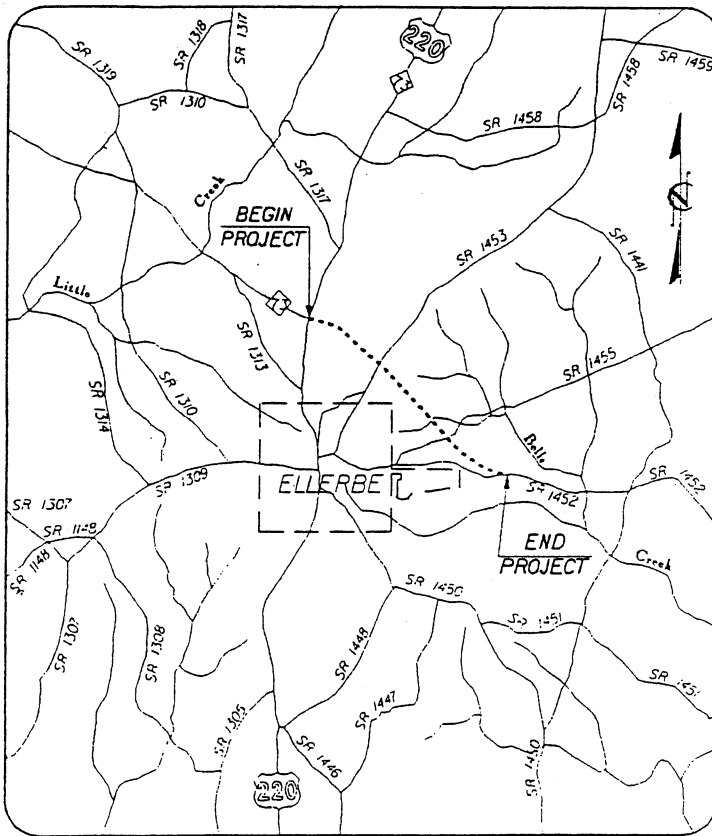
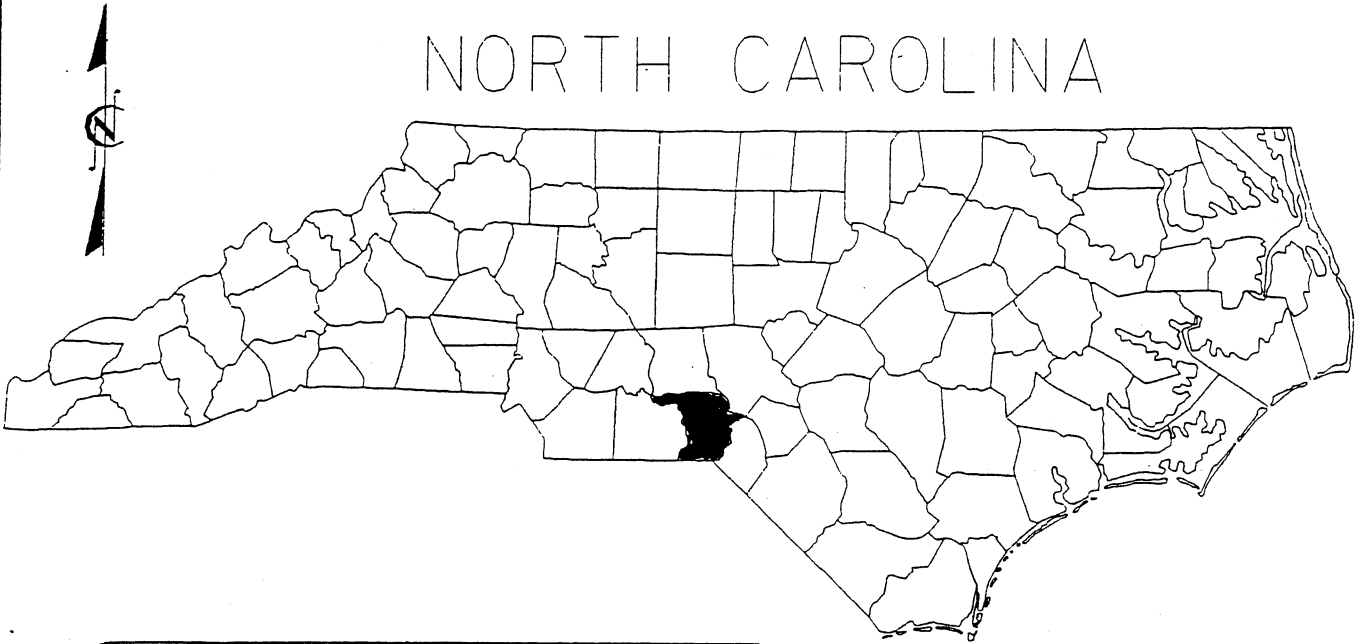


10/28/02

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (Ac)	Temp. Fill In Wetlands (Ac)	Excavation In Wetlands (Ac)	Mechanized Clearing (Method III) (Ac)	Fill In SW (Natural) (Ac)	Fill In SW (Pond) (Ac)	Temp. Fill In SW (Ac)	Existing Channel Impacted (FT)	Natural Stream Design (FT)
1	242+80 -L-	1050 rcp	0.51		0.0086	0.04	0.052			564.3	
2	249+60-249+80-L-	N/A	0.03			0.015					
3	253+00-255+60-L-	1 @ 2.1m X 1.5m RCBC	1.84		0.04075	0.25	0.067			754.6	423.2
4	258+40-259+10-L-	450 rcp	0.63			0.017					
5	260+20-261+60-L-	1500 rcp	1.29		0.00099	0.074	0.072			478.9	
6	267+80-268+80-L-	1500 rcp	0.89		0.0183	0.116	0.062			574.1	252.6
7	271+20-271+80-L-	1350 rcp	0.22			0.027	0.025			321.5	

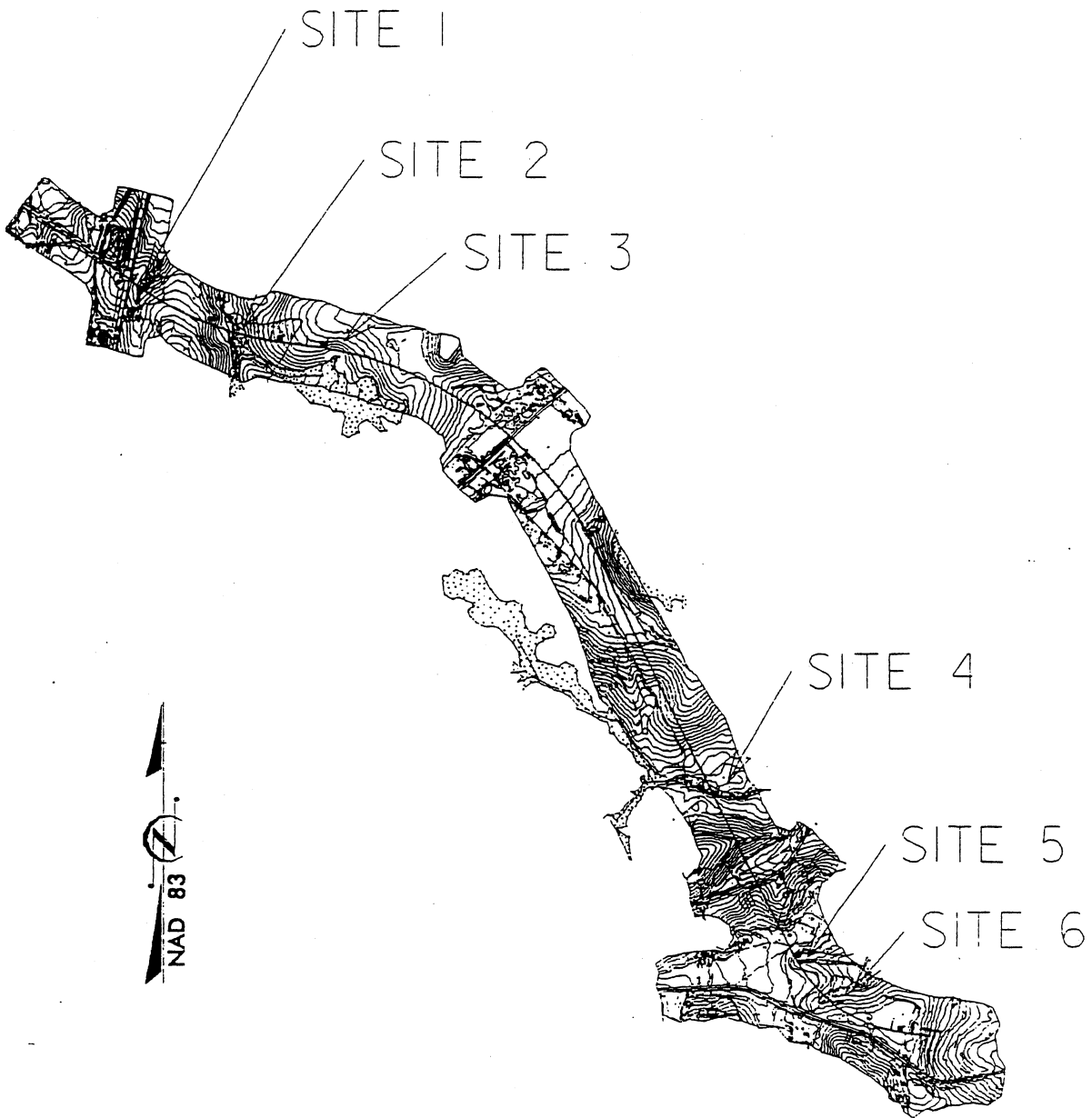
Rev. 10/28/2002

NORTH CAROLINA



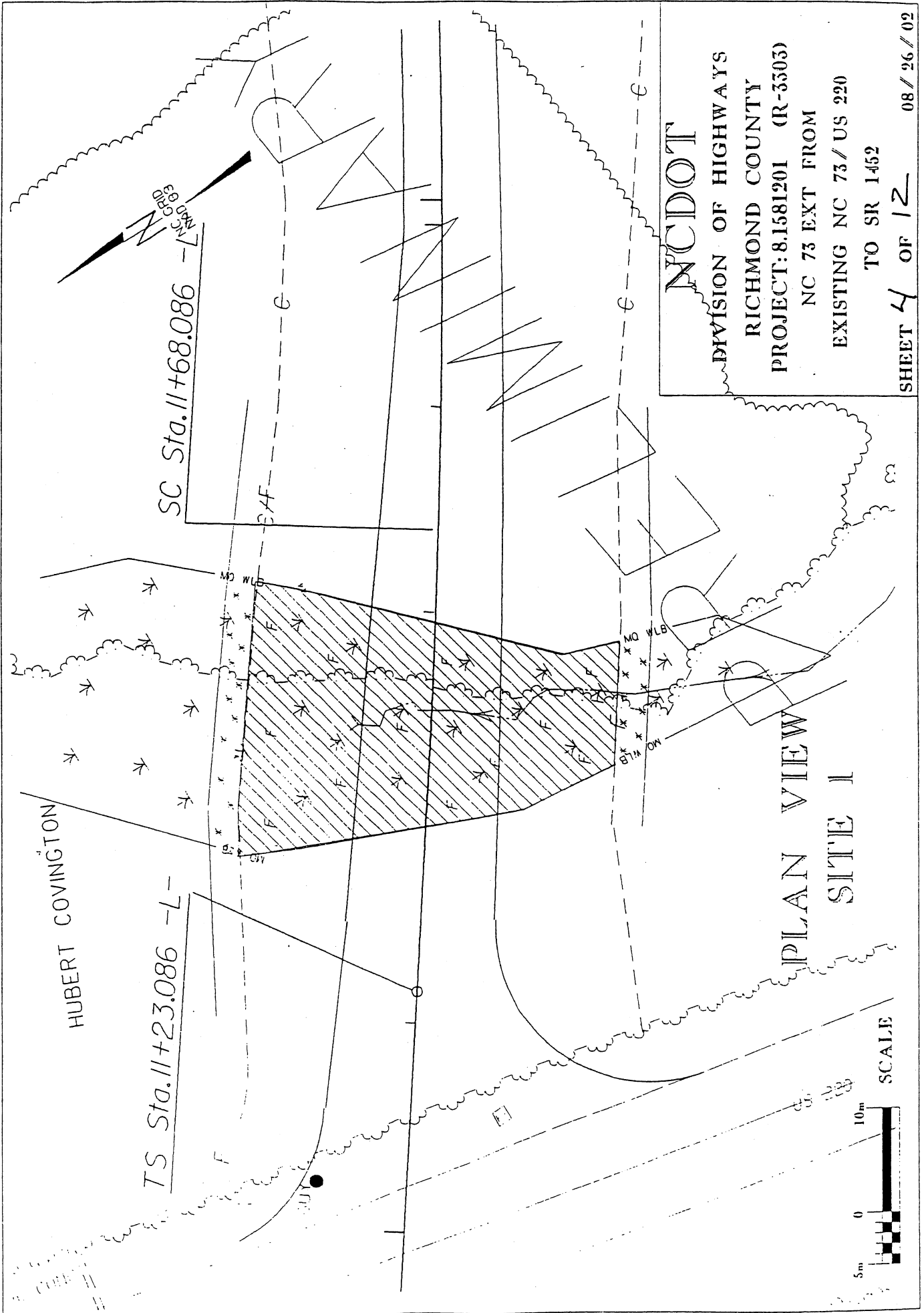
VICINITY MAPS

NCDOT
DIVISION OF HIGHWAYS
CABARRUS COUNTY
PROJECT: 8.1581201 (R-5505)
NC 73 EXT FROM
EXISTING NC 73/ US 220
TO SR 1452



SITE MAP

NCDOT
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.1581201 (R-5505)
NC 75 EXT FROM
EXISTING NC 75 / US 220
TO SR 1432
SHEET 2 OF 12 08/26/02



NC DOT

DIVISION OF HIGHWAYS

RICHMOND COUNTY

PROJECT: 81581201 (R-3503)

NC 73 EXT FROM

EXISTING NC 73 / US 220

TO SR 1452

SHEET 4 OF 12

08 / 26 / 02

WETLAND LEGEND

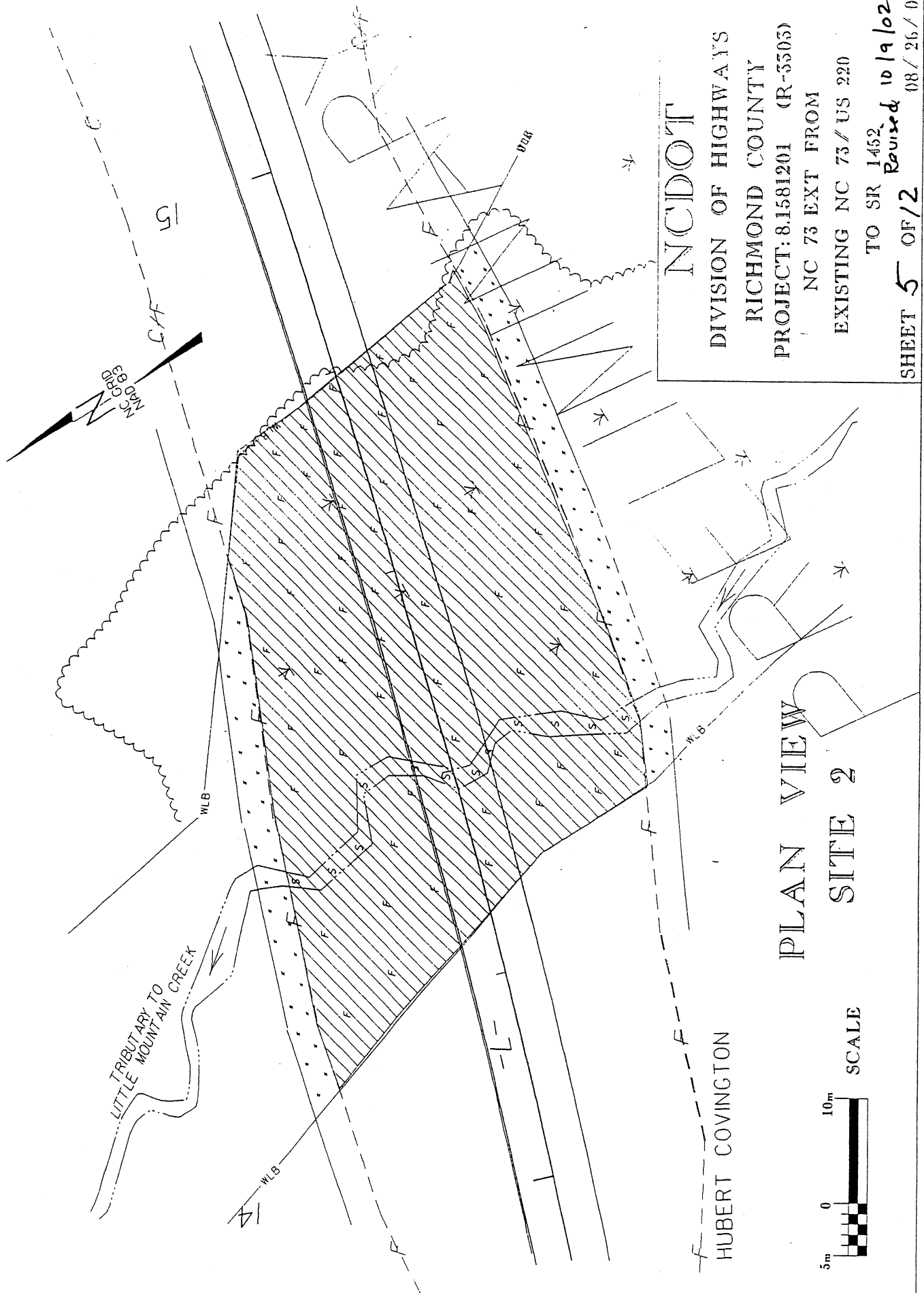
	WETLAND BOUNDARY		PROPOSED BRIDGE
	WETLAND		PROPOSED BOX CULVERT
	DENOTES FILL IN WETLAND		PROPOSED PIPE CULVERT 12"-48" PIPES 54" PIPES & ABOVE
	DENOTES FILL IN SURFACE WATER	(DASHED LINES DENOTE EXISTING STRUCTURES)	
	DENOTES FILL IN SURFACE WATER (POND)		SINGLE TREE
	DENOTES TEMPORARY FILL IN WETLAND		WOODS LINE
	DENOTES EXCAVATION IN WETLAND		DRAINAGE INLET
	DENOTES TEMPORARY FILL IN SURFACE WATER		ROOTWAD
	DENOTES MECHANIZED CLEARING		RIP RAP
	FLOW DIRECTION		ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
	TOP OF BANK		PREFORMED SCOUR HOLE
	EDGE OF WATER		LEVEL SPREADER (LS)
	PROP. LIMIT OF CUT		DITCH / GRASS SWALE
	PROP. LIMIT OF FILL		
	PROP. RIGHT OF WAY		
	NATURAL GROUND		
	PROPERTY LINE		
	TEMP. DRAINAGE EASEMENT		
	PERMANENT DRAINAGE EASEMENT		
	EXIST. ENDANGERED ANIMAL BOUNDARY		
	EXIST. ENDANGERED PLANT BOUNDARY		
	WATER SURFACE		
	LIVE STAKES		
	BOULDER		
	CORE FIBER ROLLS		

NCDOT
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.1581201 (R-5305)
NC 75 EXT FROM
EXISTING NC 75 / US 220
TO SR 1452

SHEET 5 OF 2

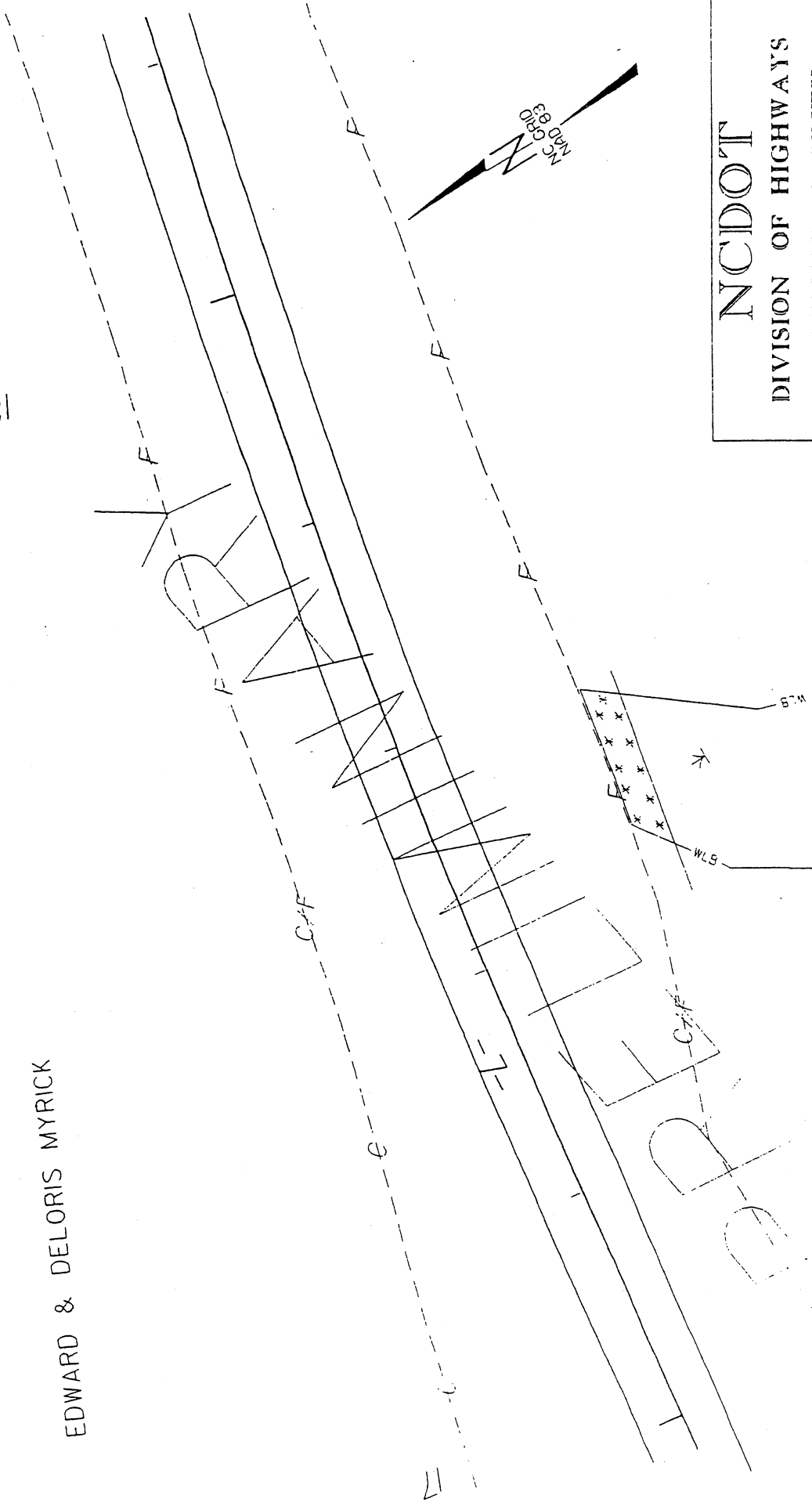
PLAN VIEW
SITE 2

HUBERT COVINGTON

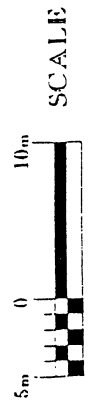


EDWARD & DELORIS MYRICK

81



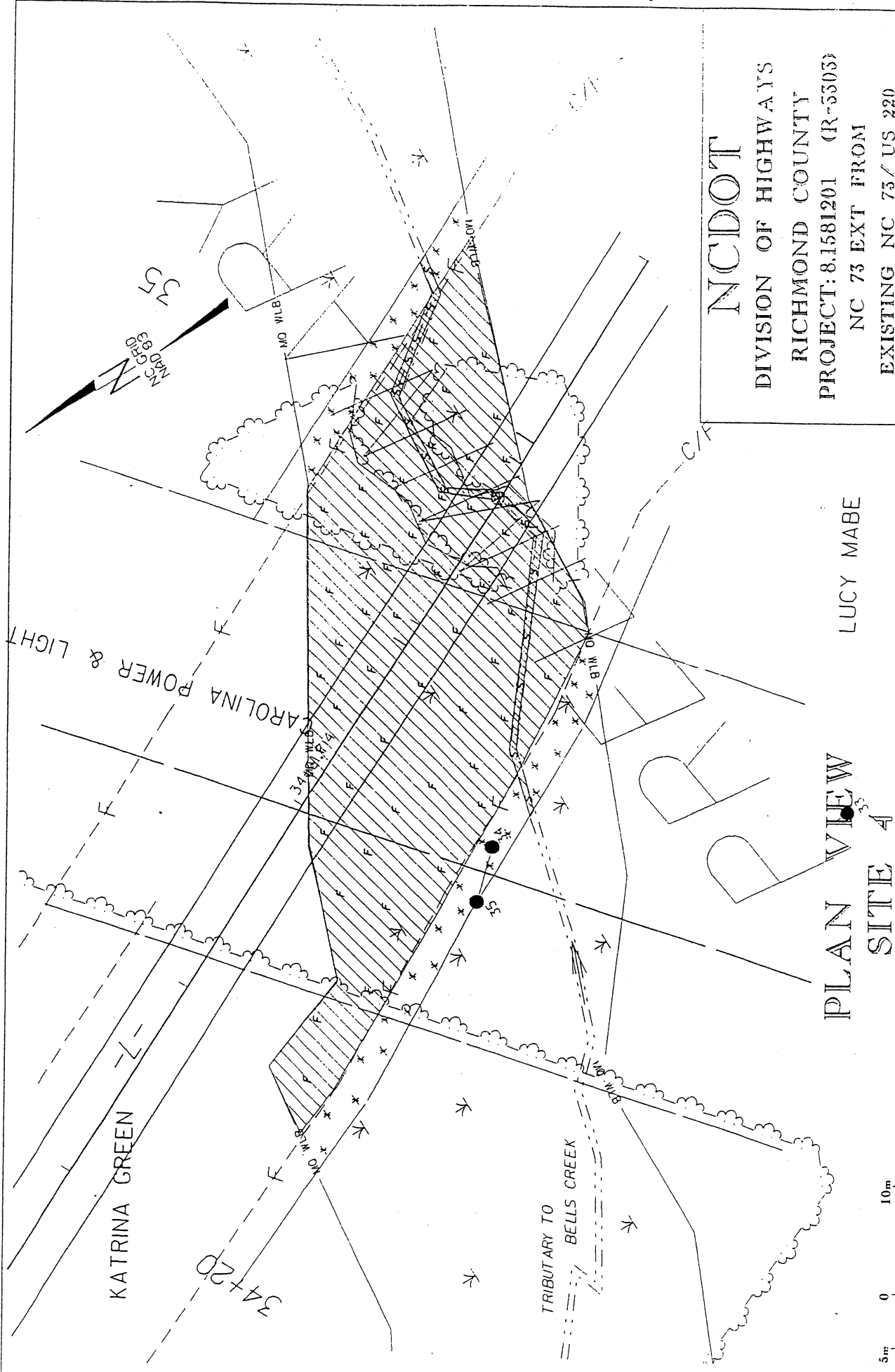
PLAN VIEW
SITE 3



SCALE

NCDOT
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.1581201 (R-3303)

NC 73 EXT FROM
EXISTING NC 73 / US 220
TO SR 1452



NCDOT

DIVISION OF HIGHWAYS

RICHMOND COUNTY

PROJECT: 8.1581201 (R-5303)

NC 73 EXT FROM

EXISTING NC 73 / US 220

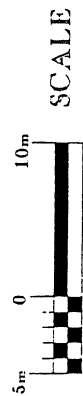
TO SR 1452

SHEET 7 OF 12

Revised 10/9/02
08 / 26 / 02

LUCY MABE

PLAN VIEW
SITE 4



SCALE

DIVISION OF HIGHWAYS

RICHMOND COUNTY

PROJECT: 8.1581201 (R-3303)

NC 73 EXT FROM

EXISTING NC 73 // US 220

TO SR 1452

SHEET 8 OF 12

08 / 25 / 02

PROPERTY OWNERS

NAMES AND ADDRESSES

NAMES	ADDRESSES
HUBERT COVINGTON	2260 NORTH US 220 ELLERBE, NC 28338
EDWARD & DELORIS MYRICK	4450 NE 31 AVE POMPANO BEACH, FL 33064
KATRINA GREEN	2370 SPRINGS RUN WAY DECATUR, GA 30032
LUCY MABE	249 FIRETOWER RD ELLERBE, NC 28338
ROGER ALLRED, SR, ET AL	6726 LANCER DR CHARLOTTE, NC 28226
RICHARD & RUBY HENDERSON	P.O. BOX 463 ELLERBE, NC 28338

NCDOT

DIVISION OF HIGHWAYS

RICHMOND COUNTY

PROJECT: 8.1581201 (R-5505)

NC 73 EXT FROM

EXISTING NC 73 / US 220

TO SR 1452

SHEET 10 OF 12

08 / 26 / 02

NOT

DIVISION OF HIGHWAYS

RICHMOND COUNTY

PROJECT: 81581201 GR-3303

NC 73 EXT FROM

EXISTING NC 73 // US 220

TO SR 1452

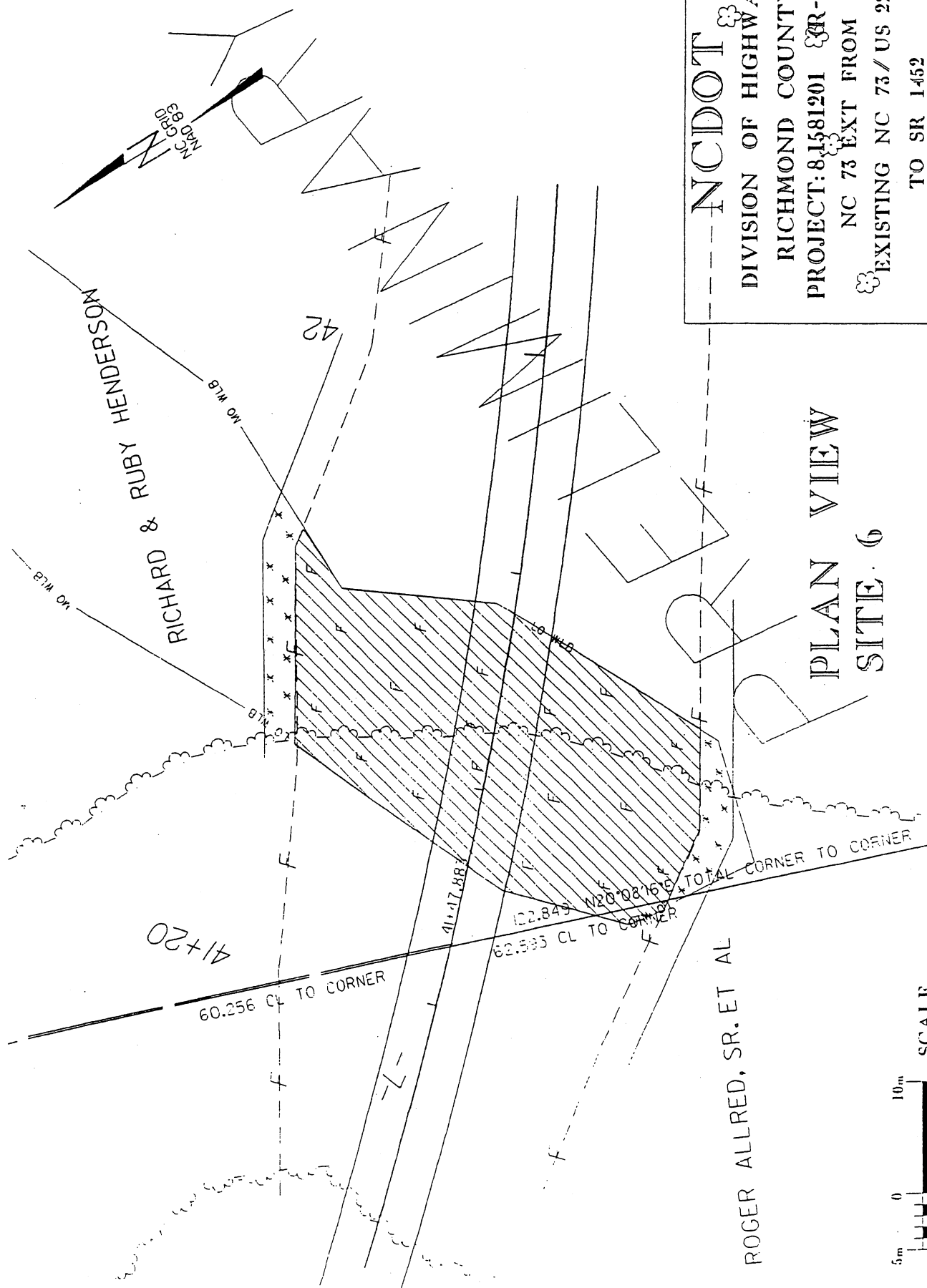
SHEET 9 OF 12

50/96/80

PLAN VIEW SITE 6

ROGER ALLRED, SR. ET AL

SCALE



WETLAND PERMIT IMPACT SUMMARY

[illegible]

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RICHMOND COUNTY
PROJECT: 8.1581201 (R-3303)
NC73 EXT FROM NC73/US220 TO SR1452
SHEET 12 of 12
Revised 10/9/02 8/26

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